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Towards a Social Model of Posttraumatic Stress

The role of adult attachment and group identification in a
posttraumatic context

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Submitted for the degree of Doctor of Philosophy in Psychology,

University of Sussex, November 2018

Declaration

The thesis conforms to an ‘article format’ in which the middle chapters consist of discrete articles written in a style that is appropriate for publication in peer-reviewed journals in the field. The first and final chapters present synthetic overviews and discussions of the field and the research undertaken. These chapters were written by the first author, with feedback provided by Professor Rupert Brown.

Chapters 2 and 3 have been published, and chapters 4 and 5 will be submitted imminently for publication, in peer reviewed journal (full references below). The versions presented here are the final published manuscripts, or the manuscripts that will be submitted for publication. The papers are my own work with supervisory input from the second and third authors. I wrote the first drafts and took the lead on all subsequent revisions including those suggested as part of the peer-review processes.

Chapter 2: Woodhouse, S., Ayers, S., & Field, A. (2015). The relationship between adult attachment style and posttraumatic stress symptoms: a meta-analysis. *Journal of Anxiety Disorders*, 35, 103-117.

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Chapter 5: Woodhouse, S., Brown, R., & Ayers, S. (2018). A longitudinal study of the impact of adult attachment and group identification on postnatal posttraumatic cognitions/symptoms and well-being after birth.

I hereby declare that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

Signature:.....

Acknowledgements

Many people have supported me in writing this thesis. First I would like to thank my supervisor, Rupert Brown. I am so grateful for his expert guidance, his encouragement, and his calm handling of all the various trials and tribulations we've faced along the way. Whatever has arisen he has smiled, and said 'ok, we can deal with that' – and for that I am extremely grateful. Susan Ayers, my second supervisor, believed in me and inspired me all those years ago. I will always be grateful for the opportunity and direction she gave me.

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UNIVERSITY OF SUSSEX

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THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF

PHILOSOPHY IN PSYCHOLOGY

TOWARDS A SOCIAL MODEL OF POSTTRAUMATIC STRESS

THE ROLE OF ADULT ATTACHMENT AND GROUP IDENTIFICATION IN A
POSTTRAUMATIC CONTEXT

Summary

Researchers in the field of posttraumatic stress are widely agreed that social models of trauma are needed (e.g., Charuvastra & Clotre, 2008). Leading models of trauma symptoms consist of cognitive mechanisms and constructs, with social factors often only included as secondary components (e.g. Ehlers & Clark, 2000). However, meta-analyses of risk factors for Posttraumatic Stress Disorder (PTSD) routinely confirm that social support is one of the strongest predictors of symptom severity (e.g. Brewin, Andrews, & Valentine, 2000; Ozer et al., 2003). The meta-analytic results support future research, but the social support is a multi-dimensional ‘catch-all’ construct. The success of any future social model of posttraumatic stress symptoms (PTSS) is reliant on researchers finding more focused, nuanced, ways of understanding support and social/relational factors.

The overarching purpose of this thesis was to highlight specific social factors worthy of inclusion in a future social model of PTSS. Two more specific aims guided the research. First, the thesis aimed to investigate the relationship between adult attachment and the development of symptoms of PTSD. Second, the thesis aimed to

examine the role of social factors (e.g., group identification) in a posttraumatic context. These aims were assessed first through a meta-analytic study of published research on the relationship between adult attachment and PTSD. Following this, two cross-sectional studies were conducted. The first proposed an exploratory social model, and tested the model using data from participants recruited online who experienced various traumas. The second explored the relationship between group identification and posttraumatic cognitions/symptoms in a small treatment-seeking military sample. Lastly, using a longitudinal design, the relationship between group identification (family and friends vs antenatal group) and posttraumatic cognitions/symptoms and well-being was examined in a large sample of women before and after birth.

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Chapter 1

Introduction

Posttraumatic Stress Disorder (PTSD)

Posttraumatic Stress Disorder (PTSD) is a specific set of prolonged symptoms experienced in response to a very stressful event. Although Posttraumatic Stress Symptoms (PTSS) are considered a normative response to experiencing extreme stress, the symptoms can be overwhelming and debilitating. Should symptoms persist beyond one month after the traumatic event, a diagnosis of PTSD can be made. Symptoms are grouped into four categories: re-experiencing and intrusions, hyperarousal, avoidance/numbing of emotions, and negative cognitions and mood (Am. Psych. Assoc., 2013a). Re-experiencing symptoms include involuntary recollections of the event in the form of distressing images, flashbacks or nightmares. Hyperarousal symptoms refer to the physiological aspects of the traumatic response: insomnia, irritability, hypervigilance, impaired concentration and an overactive startle response. Avoidance symptoms consist of attempts to avoid external reminders of, and thoughts/feelings about, the event, largely to try and limit triggering the other myriad of symptoms. Negative cognitions and mood includes a persistent and distorted sense of blame of self or others, estrangement from, and mistrust of, self or others and a markedly diminished interest in activities. (Am. Psych. Assoc., 2013b).

It is estimated that as many as 90% of people experience or witness traumatic events during their lives (Kilpatrick et al., 2013). PTSD prevalence rates are challenging to fully comprehend because of the large prevalence variability between events and samples, and the relative scarcity of large-scale epidemiological prevalence

studies. As an example, the general population lifetime prevalence rate for PTSD is estimated at between 0 – 0.7% in Switzerland, between 7.8% and 9% in the USA and 11.2% in Mexico (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Kilpatrick et al., 2013; Perrin et al., 2014). However, these general population studies vary greatly in size and methods (Perrin et al., 2014). It is estimated that 10 – 13% of women will experience PTSD in their lifetime, compared to 5 – 6% of men (USA samples, Kessler et al., 1995; Breslau, Kessler, Chilcoat, Schultz, Davis, Andreski, 1998). Symptoms of PTSD have been found to be higher in the unemployed (12.5%) and in lower income households (14.8%) (Urban UK sample; Frissa, Hatch, Gizard, Fear, & Hotopf, 2013). Lifetime risk of PTSD following sexual abuse is as high as 47%, witnessing violence 20%, being involved in an accident 16%, and following any trauma 23% (Perrin et al., 2014).

Diagnosis of PTSD *requires* a traumatic event which involves real or threatened death, serious injury or sexual violence to self or others. Some of the more common traumatic events experienced are serious accidents, physical assault, natural disasters and witnessing death or injury (Kessler et al., 1995). Traumatic events experienced during active military duty are historically well researched, as is research into women who experienced sexual assault (Ozer, Best, Lipsey, & Weiss, 2003). Recent years have seen an increasing amount of research into events previously unrecognized as traumatic – for example, traumatic births. Diagnostic Criterion A – which defines the stressor events that qualify as being capable of producing PTSD – must be met, irrespective of the presence of PTSS. The necessity of the event in the diagnosis implies a unique relationship between the disorder and trauma, which is misleading (Brewin, Lanius, Novac, Schnyder, & Galea, 2009). People exposed to traumatic events are at increased risk from major depression. This is one of many reasons that the specificity of

the event in the diagnosis of PTSD is controversial (Brewin et al., 2009; Kilpatrick, Resnick, & Acierno, 2009).

In every revision of the Diagnostic and Statistical Manual (DSM) the definition of Criterion A has been changed (Weathers & Keane, 2007). In 2013, the qualifying events were altered to specifically include indirect exposure to recurring traumas in the line of professional duties (e.g., first responders, medics, police officers). Other events, for example, the unexpected death of a family member or close friend due to natural causes were removed (Am. Psych. Assoc., 2013b; National Centre for PTSD, 2017). Psychosocial stressors (e.g., divorce or job loss) and non-catastrophic life-threatening illness, such as terminal cancer, no longer qualify as trauma, regardless of how stressful or severe (Pai et al., 2017). Criterion A2 – the experience of intense fear, hopelessness or horror in response to the event – was also removed as it proved to have no utility in predicting PTSD (Am. Psych. Assoc., 2013b).

The changes are detailed above to give a sense that within the field Criterion A, and the attempted definition of what constitutes a ‘traumatic event’, is often seen as subjective, constantly in need of review and, according to some, unnecessary (e.g., Brewin et al., 2009; Kilpatrick et al., 2009; Pai et al., 2017). For the purpose of this thesis we are of course interested in the nature of the traumatic events experienced by our participants, but more importantly we are interested in the severity of their symptoms. A new mother who has not experienced a traumatic birth in the conventional sense, still requires our consideration as researchers if she develops PTSS; as does a veteran who has incapacitating but sub-threshold PTSD. Further, a new mother who experiences a traumatic birth but develops depression not PTSD, or a veteran with no trauma symptoms but high levels of general distress, is also worthy of our attention. This final point is particularly important given that factor analyses consistently indicate

that PTSD has substantial symptom overlap with other clinical disorders, for example depression and anxiety. Adding more symptom criteria – negative cognitions and mood – has therefore fueled criticism that PTSD is no longer a distinct disorder (Pai et al., 2017). This has implications, beyond the scope of this thesis, in terms of how accurately we can model a disorder with such burgeoning criteria and overlap with other disorders.

Risk and resilience factors

A great number of people have traumatic experiences, but only a proportion of these go on to develop prolonged PTSS and PTSD. Researchers in the field are tasked with understanding the risk and resilience factors behind the prevalence rates reported above. The most important question facing us is: why can two individuals experience the same event, and one walk away unscathed and the other develop prolonged PTSD? Given that PTSD involves a complex matrix of symptoms, and the highly variable prevalence rates we see, the task is not easy. Meta-analyses of risk factors for PTSD find psychiatric history, child abuse, family psychiatric history, trauma severity, lack of social support, additional life stress (Brewin, Andrews, & Valentine, 2000) and peritraumatic dissociation (Ozer et al., 2003) to be the strongest known predictors of symptom severity. The meta-analyses included studies of a variety of traumatic events and samples. The results are therefore generalisable to *all* traumatic events, and can therefore be widely applied and relied upon clinically, irrespective of the nature of the trauma experienced.

Risk factors for PTSD within specific samples and following specific event types are also necessary to provide detail. Moller, Backstrom, Sondergaard and Helstrom (2014) analysed the prevalence of PTSD six months after sexual assaults and identified the major risk factors for developing PTSD in an all female sample. The

major risk factors for PTSD were having been sexually assaulted by more than one person, suffering from acute stress disorder (ASD) shortly after the assault, having been exposed to several acts during the assault, having been injured, having co-morbid depression, and having a history of more than two earlier traumas. In a meta-analytic study of risk factors for combat-related PTSD among military personnel and veterans Xue et al. (2015) found eighteen significant predictors including female gender, ethnic minority status, low education, non-officer rank, prior trauma exposure, severity of trauma, combat exposure, and post-deployment support. Various studies have highlighted insecure attachment as a risk factor for developing PTSD after numerous traumatic events, including combat (e.g., Frey, Blackburn, Werner-Wilson, Parker, & Wood, 2011; Ghafoori, Hierholzer, Howsepian, & Boardman, 2008), child sexual abuse (e.g., Elklit, 2009), childbirth (e.g., Ayers, Jessop, Pike, Parfitt, & Ford, 2014), and physical violence (e.g., Bogaerts, 2008).

Resilience factors are not just the opposite of risk factors, but also require independent verification. Pietrzak et al. (2014) considered trajectories of individual PTSD risk and resilience factors in responders to the September 11th 2001 World Trade Centre (WTC) terrorist attacks. They found that greater education and family and work support while working at the WTC site were protective against several of the trajectories. Olatunji, Armstrong, Fan and Zha (2014) investigated whether anxiety sensitivity and disgust sensitivity are best conceptualised as risk or resilience factors for PTSD. Veterans with PTSD, veterans without PTSD and a healthy non-veteran control group were compared. Results suggest that lower disgust sensitivity may be a significant resilience factor against PTSD. Tran, Gluck and Lueger-Schuster (2013) examined positive adaptation despite traumatic experiences in a sample of Austrian survivors of World War II. They found that a smaller number of life-time traumata and

a medium level of education were associated with a better outcome. Psychologically healthy participants were characterised by a challenge-oriented and humorous attitude towards stress.

Leading models of PTSD

Models of PTSD attempt to explain symptom variance, and in doing so help assist clinicians in determining, firstly, who is at the greatest risk of PTSD and, secondly, in the aftermath of a trauma the type of interventions that should be in place to boost individual and community resilience. Four influential models are detailed below: shattered assumptions, emotional processing, dual representation and cognitive.

The socio-cognitive theory of shattered assumptions focuses on individual assumptions that help people overcome difficulties and cope with life (Janoff-Bulman, 1992). The three deeply held assumptions regarded by Janoff-Bulman (1992) as the most influential within a posttraumatic context are: the world is benevolent, the world is meaningful, and the self is worthy. Being attacked by a complete stranger, for example, may shatter these assumptions in that we no longer believe that other people will treat us well, or that there are reliable rules and principles that we all obey. The fact that the self was attacked (over another human) also leads us to question our worth.

Although the theory has been highly influential – its influence can be seen in the models outlined below – taken in isolation it is no longer considered viable. Following the logic of the theory, individuals with the most deeply held positive assumptions would be those most greatly affected by traumatic events, however, we know this is not the case (Resick, 2001). Despite this, the model is important as it identifies common themes in schema change, “specifying the role of the person’s social and interpersonal context in facilitating or blocking this process, and emphasising the possibility of

positive reframing of the trauma and of posttraumatic growth.” (p. 347, Brewin & Holmes, 2003).

The emotional processing model of PTSD (Foa & Kozak, 1986; Foa & McLean, 2016) focuses on the role of fear, and has greatly influenced our understanding of all anxiety disorders. Although PTSD is no longer classified as an anxiety disorder (Am. Psych. Assoc., 2013a), their work remains highly influential clinically. They propose that PTSD arises from specific pathological fear structures in the long-term memory. Fear is represented in the memory as structures made up of associated stimulus, response and meaning elements designed to escape danger. For example, a fear structure may include a knife as the stimulus, which is then connected to various behavioural and physiological responses (e.g., running away, screaming, heart racing, etcetera). These are also connected to various meaning elements (e.g., ‘I am going to die’). When something in the environment matches one element of the fear structure (e.g., they hear screaming), the entire fear structure is activated (Foa & Kozak, 1986; Foa & McLean, 2016).

The emotional processing model does not explicitly include social factors, but includes social *referencing* through the presence of dysfunctional cognitions and appraisals (i.e., negative appraisals of the world and others). Rauch and Foa (2006) explain that the pathological fear response leads to two basic dysfunctional cognitions which then underlie the development and maintenance of PTSD. First, that one’s self is unable to cope with stress and is incompetent. Second, that the world is extremely dangerous. Both cognitions are externally referent and relational in nature. The first refers to an individual’s perceived sense of control/self-efficacy within their environment; the second, an individual’s perceived sense of safety within their environment.

Dual representation models focus on the role of imagery and memory, and propose that trauma memories are represented in a fundamentally distinct way (Brewin, 2001; Brewin et al., 1996). Brewin et al.'s (1996) model proposes that there are two memory systems – verbally accessible memory (VAM) and situationally accessible memory (SAM). They propose that oral and written accounts of the trauma are drawn from the VAM. Brewin, Dalgleish, & Joseph (1996) argue that an individual's relative ease of access to these aspects of the trauma is evidence that they have been well integrated into other autobiographical memories (i.e., the individual's life story). In contrast, the SAM contains information that has not been integrated into long-term memory. SAM memories are difficult to control and access deliberately, and instead are triggered by the world around us. They propose that flashbacks contain information processed at a much lower perceptual level – for example, sights and sounds only briefly attended too during the trauma – and are therefore not recorded in the VAM, but in the SAM. They propose that the SAM also contains information about the person's bodily response to the trauma, such as pain and heart racing. Recovery requires helping block SAMs by creating new memories through cognitive restructuring and habituation (Brewin & Holmes, 2003). Brewin et al.'s (1996) focus on memory, and their attempts to specifically explain the re-experiencing symptoms has been influential. The basic idea is well regarded and has implications for treatment, and it has influenced later models (Brewin & Holmes, 2003; Ehlers & Clark, 2000), but its relatively narrow focus means that it cannot explain PTSD in its totality.

Ehlers and Clark (2000) proposed a cognitive model to explain the persistence of PTSD and provide a framework for the cognitive-behavioural treatment of the disorder. They propose that individuals develop PTSD if they process the traumatic experience in a way that produces a sense of current threat. Once activated the sense of

threat is accompanied by PTSS. Negative appraisals of the trauma and an inability to process the trauma memory (i.e. process the autobiographical memory so that the event becomes part of the past) maintain the sense of current threat. Maladaptive coping strategies are employed to try and reduce symptoms. However instead of reducing symptoms, these strategies actually contribute to their perseverance (Ehlers & Clark, 2000). Although the model appears simple, they provide a great deal of detail in the model explanation. Similar to the emotional processing model, social cognition and bonds are linked to negative appraisals within Ehlers and Clark's (2000) explanation:

“[I]t is common for people with persistent PTSD to give up or avoid activities that were important to them before the traumatic event, for example sports, hobbies or socialising. This prevents a change in their appraisals (p. 330) ...The quality of other people's reactions in the aftermath of the trauma (social support versus negative reactions) influences the probability of appraisals such as ‘Nobody cares about me’.” (pp. 332-333).

Like many successful models, Ehlers and Clark do not radically re-write the PTSD literature. Instead, the success of their model is found in its synthesis of elements from previous PTSD models. Considerable evidence supports the model and the mechanisms involved (Clohessy & Ehlers, 1999; Dunmore, Clark, & Ehlers, 1999, 2001; Ehlers & Clark, 2008; Ford, Ayers & Bradley, 2010; Halligan, Michael, Clark, & Ehlers, 2003; King, McKenzie-McHarg; Horsch, 2017). The model has been highly influential in the development of cognitive and cognitive-behavioural treatments for PTSD, although it has been criticised as being untestable in its totality (Dalglish, 2004).

Posttraumatic cognitions

Three of the leading models of PTSD detailed above (shattered assumptions, emotional processing and the cognitive model), and some of those that are not outlined (e.g., Joseph, Andrews, Williams & Yule, 1992), implicate posttraumatic cognitions in the development of PTSS. Considerable evidence establishes negative cognitions/appraisals as a primary mechanism through which PTSS develop and persevere (Ehlers, Ehrling, & Kleim, 2012; Dunmore, Clark, & Ehlers, 1997; Ehrling, Ehlers, & Glucksman, 2006; Foa et al. 1999). Because of the consistency of evidence of the causal relationship between posttraumatic cognitions and core trauma symptoms, the latest version of the DSM includes negative cognitions within the new fourth symptom cluster (DSM V, Am. Psych. Assoc., 2013a).

The three leading models of PTSD referred to above relate negative cognitions, and therefore PTSS, with social/contextual factors. Ehlers and Clark (2000) explain how social support and/or negative reactions influence the probability of negative appraisals (see *Leading models of PTSD* above), and how these in turn influence the perseverance of core trauma symptoms. Empirical evidence supports this (Woodward et al., 2015; Robinaugh et al., 2011). Posttraumatic cognitions involve appraisals of the traumatic event, the self and others (Foa, Tolin, Ehlers, Clark & Orsillo, 1999). Theoretical consideration of negative cognitions compels us to consider perceptions of others and how the event, and different types of event, may be being appraised. Any exploration of the impact of social cognition and bonds *requires* the inclusion of posttraumatic cognitions, which are in many ways a form of social cognition.

Evidence of the impact of social factors

There is increasing evidence that social factors impact PTSS. Their impact is demonstrated through pre-trauma risk/resilience factors, the trauma itself and in the posttraumatic environment. Research in this area has increased steadily over the past ten years, and there is no longer any doubt that the field needs to understand the impact of social factors, and build workable social models. A wide variety of social factors have been explored and found to be impactful, some of which are detailed below. Despite this, the well documented ‘social support’ effect has still not been adequately analysed to determine the specific mechanisms it comprises (Wagner, Monson & Hart, 2016).

Charuvastra and Cloitre (2008) reviewed and collated research into how social bonds may impact PTSD. They proposed a “social etiology of PTSD” (p. 301) and proposed a conceptual framework for future research. The paper encouraged new research and influenced the nature of this thesis. They highlighted four potential areas of research: interpersonal traumas, social networks and social support, traumatic events in the childhood and family context, and social cognition. Throughout this thesis we explore aspects of all four areas, and include a relatively novel theoretical direction – the process of group identification – to the mainstream PTSD literature (see *Group identification* section, below).

Interpersonal traumas

Despite the controversy surrounding Criterion A (see *Traumatic events*, above), research into ascertaining which events, or type of events, lead to elevated PTSS is necessary. One event classification known to have considerable explanatory power is the interpersonal/non-interpersonal event distinction. By ‘interpersonal’ trauma, we refer to

traumatic events that are perceived to be caused by another human being, for example a sexual assault or a robbery. ‘Non-interpersonal’ traumas are those perceived not to be caused by human design, for example a natural disaster. Numerous studies have revealed that PTSS is likely to be more severe following an interpersonal trauma, compared to a non-interpersonal trauma (Charuvastra & Cloitre, 2008; Frans, Rimmö, Åberg, & Fredrikson, 2005; Kessler et al., 1994, 2005). Despite this, full explanations of why interpersonal trauma may lead to heightened trauma symptoms are surprisingly rare and modelling of the mechanisms involved are scarce. Two main explanatory strands run through the evidence that does exist: trust and fear.

Interpersonal traumas threaten one’s capacity to trust others (Foa, Steketee & Rothbaum, 1989; Morina, Schnyder, Schick, Nickerson & Bryant, 2016). This is particularly true of childhood sexual abuse, which involves a violation within an interpersonal context and impinges on a survivor’s sense of trust and safety (Briere, 1992). In an interpersonal trauma sample of survivors of intimate partner violence, Clapp et al. (2014) aimed to determine subjective reasons for expressive inhibition (i.e., deliberately inhibiting expressions of emotion). Only mistrust/exploitation motives were uniquely associated with PTSD. They concluded that individuals who develop PTSD following an interpersonal trauma appear to hold unique reasons for restricting emotional expression, and mistrust/fear of being exploited is the primary justification. Charuvastra and Cloitre (2008) explain that the subsequent mistrust that follows an interpersonal trauma may reflect the evolutionary significance of social bonding. Human survival depends on the ability to form “co-operative social networks based on trust and norms of behavior. Exposure to cruelty, perversion, or betrayal may lead to a greater sense of threat or fear.” (p. 305).

Throughout Charuvastra and Cloitre’s (2008) paper, the importance and

significance of *fear* in the context of interpersonal trauma is highlighted, and connected to the subjective meaning we ascribe to the event. “The appraisal of an event as human-caused appears to be particularly fear inducing.” (p. 303). Ozer, Best, Lipsey and Weiss (2003) found that perceived life threat during the event was more predictive of PTSD following an interpersonal trauma than a non-interpersonal one, suggesting that fearing for one’s life is more uniquely associated with interpersonal trauma. Despite this finding, the removal of diagnostic Criterion A2 – the experience of intense fear, hopelessness or horror in response to the event – from DSM V, due to its overall poor utility in predicting PTSD (Am. Psych. Assoc., 2013b) suggests that the evidence connecting fear to both interpersonal and non-interpersonal trauma needs reviewing. Rather than being specifically tied to the event, fear, as well as hopelessness and horror, are now conceived as operating in the short and long-term posttraumatic environment through the new fourth symptom cluster.

Badour, Resnick and Kilpatrick (2017) explored the prevalence and correlates of the new fourth symptom cluster Criterion D4, which is aimed at assessing problems with persistent negative emotional states (e.g., fear, anger, shame, guilt, horror and hopelessness). In a large sample of adults with a history of interpersonal trauma they found negative affect to be particularly high among individuals with sexual or physical assault-related PTSD (AR-PTSD). Problems with fear, anger and shame were uniquely associated with AR-PTSD, and anger and shame were particularly predictive. Charuvastra and Cloitre (2008) were correct in their assertion that interpersonal trauma leads to elevated posttraumatic stress via elevated affect, but more recent research emphasises the role of anger and shame over and above fear (Badour, Resnick, & Kilpatrick, 2017).

Emotional disclosure

There is evidence that discussing traumatic or stressful experiences may reduce distress and PTSS (Bedard-Gilligan, Jaeger, Echiverri-Cohen & Zoellner, 2012; Bonnan-White, Hetzel-Riggin, Diamond-Welch & Tollini, 2015; Davidson & Moss, 2008; Pennebaker, Zech, & Rimé, 2001). There is also evidence that talking about interpersonal traumatic events is more difficult than talking about non-interpersonal events (Bedard-Gilligan et al., 2012; Bonnan-White et al., 2015). Research into emotional disclosure uses either controlled emotional disclosure techniques (e.g., participants are encouraged to write about a traumatic/stressful event from their past), or employs self-report measures aimed at determining the extent, detail and difficulty of disclosure to friends/family in the participant's social network (e.g., 'How many times have you told the full story – including your surroundings, feelings, thoughts, and the involvement of yourself/others – of what happened?'). Talking about traumatic or stressful experiences may promote emotional processing, which is theoretically implicated in recovery from PTSD (e.g., Foa & Kozak, 1986).

Disclosing emotions is a relational interpersonal process: it requires another person, and that individual's receptiveness and reactions will actively shape how easy or difficult the process is for the traumatised individual. In addition to testing the influence of event type (interpersonal or non-interpersonal) on disclosure, Bonnan-White, Hetzel-Riggin, Diamond-Welch and Tollini (2015) examined the effect of the confided-in persons' *reaction*. Women and survivors of non-interpersonal trauma reported more supportive responses than men and survivors of interpersonal trauma. In addition, victim blame (i.e., if the first person the survivor told about the event reacted by blaming the survivor) was associated with more negative trauma-related cognitions and trauma-related distress.

Hoyt and Renshaw (2014) interviewed U.S. veterans of the wars in Afghanistan and Iraq, and their spouses. Veterans completed measures of combat exposure, PTSS, social support and emotional disclosure at two separate time points after deployment. Results indicate that emotional disclosure significantly predicts PTSS even after controlling for previous PTSS and combat exposure. Of interest, negative emotions related to veterans' combat experience (i.e., anger, anxiety) were significantly more likely to be shared with someone who had similar combat experience than someone who had no combat experience (i.e., their spouse). The study, along with Bonnan-White et al.'s (2015) study, highlight the relational, dynamic, nature of social bonds and social processes, and emotional disclosure specifically. The reactions and perceived life experience of the individual being disclosed to by the traumatised individual, interact with the disclosure process.

Social support

Definitions of social support vary (e.g., Cobb, 1976; Joseph, 1999) but the term tends to refer to the support people receive from their close friends and family, groups and the larger community, leading to a sense that one is cared for. Meta-analyses of risk factors for PTSD find lack of social support to be one of the strongest predictors of symptom severity (Brewin et al., 2000; Ozer et al., 2003). Social support is significantly related to PTSS in a plethora of studies including victims of assault (Zoellner, Foa, & Bartholomew, 1999), breast cancer survivors (Andrykowsky & Cordova, 1998), Vietnam war veterans (Schnurr, Lunney, & Sengupta, 2004) and World War II veterans (Jankowski et al., 2004). A wide variety of different social support measures exist, all of which operationalise the construct in different ways (see Guay, Billette & Marchand, 2006). In the above studies alone, support measures include confidant and affective

support (Andrykowsky & Cordova, 1998), the availability of others to fulfill specific needs (Jankowski et al., 2004) and structural support and quantity of support (Schnurr, Lunney, & Sengupta, 2004).

Although social support is often presented as unidimensional, it is made up of many relational social and interpersonal processes. For example, emotional disclosure – the process of talking about our feelings with another person – is encompassed within many social support measures, but is also explored as a unique construct within the emotional disclosure literature (e.g., Pennebaker, 1993; Pennebaker, Zech, & Rimé, 2001). This thesis acknowledges the importance of social support in the posttraumatic context, but explores the relational social and interpersonal processes involved rather than focusing solely on the construct itself. This approach enables the field to build on the success of the social support construct, whilst moving theory and research forward.

Social acknowledgement and societal disapproval

Studies of veterans returning from politically sensitive conflicts (e.g., the Lebanon war and Vietnam war), indicated that low societal appreciation and high societal disapproval relate to higher PTSS (Fontana & Rosenheck, 1994; Solomon, Mikulincer, & Flum, 1989). In response to these findings, Maercker and Müller (2004) proposed the trauma-specific concept of ‘social acknowledgement’ (Wagner, Keller, Knaevelsrud & Maercker, 2011). They define it as “a victim’s experience of positive reactions from society that show appreciation for the victim’s unique state and acknowledge the victim’s current difficult situation.” (Maercker, Povilonyte, Lianova & Pöhlmann, 2009, p. 249). Maercker et al. (2009) state that the social acknowledgment construct is “part of the broader social support concept, [but] focuses specifically on subjectively perceived, positive forms of recognition or, conversely, on disapproval” (p.

249). An additional element to the acknowledgment construct, which separates it from traditional social support concepts, is that they aim to measure recognition and disapproval at all social levels (from the inner circle of close family and friends, the ‘intermediate’ circle of other friends, family and acquaintances, and the outer circle of people in the community including the media).

High social acknowledgment (low perceived disapproval and high recognition) has been shown to relate to lower PTSS in refugees (Maercker et al., 2009), witnesses of assisted suicide (Wagner et al., 2011), crime victims (Müller & Maercker, 2006), and traumatised developmental aid workers (Jones, Müller, & Maercker, 2006). Xu et al. (2015) tested their web-based social acknowledgment and disclosure intervention in a randomised controlled trial (RCT). After one month, the intervention had significantly increased social acknowledgement and emotional disclosure, and this improvement mediated a significant reduction in PTSS (Xu et al., 2016). Given the relative success of the social acknowledgement construct, and its novel approach to understanding social relationships, it warrants consideration as the field builds social models of trauma.

Towards a social model

Largely building on the research outlined above, a small number of social models of posttraumatic stress have been proposed. Two of these models are briefly outlined here, and certain aspects of these models are built on within this thesis.

Firstly, and based on the successful application of their ‘social acknowledgment’ construct (see *Social acknowledgement and social disapproval*, above), Maercker and Horn (2013) propose a multi-level socio-interpersonal model. They propose that following a traumatic event (interpersonal/non-interpersonal), an individual’s social-affect (shame, guilt, anger, revenge) will influence their close

interpersonal relationships through emotional disclosure processes, perceived social support, and perceived empathy. In turn, relations with those closest to the individual will affect the individual's perception of wider social interactions. The distant social context (collective experience of trauma, social acknowledgement and cultural values) will also shape the individual's social relationships. They propose these interwoven social/interpersonal factors will lead to perseverant posttraumatic symptoms at the individual level, and that some of the broader traumatic responses (e.g., reduced well-being, possible social segregation) will cyclically feedback into the model itself. The model is complex, and as a result largely untestable in its totality, but the principles the model follows are arguably more important than the intricacies of the model. Maercker and Horn's (2013) model encourages the field to think about the individual, interpersonal relationships, groups, and society. They highlight the reciprocal, interactive, nature of these 'levels', and urge the field to view interpersonal and social factors as dynamic.

Secondly, in their social-cognitive model of PTSD, Sharp, Fonagy, and Allen (2012) propose that social cognition (e.g., social support, trust and social acknowledgement) mediates the relationship between the traumatic event and PTSS. They propose that social cognition is greatly affected by early care-giving experiences through attachment schemas, with insecurely attached adults more likely to develop PTSD. The model's sole use of attachment theory to explain the development of PTSS via social cognition ensures it is notably simple, making it both empirically testable and clinically applicable.

Adult attachment: why relationship styles matter

Attachment is a term used to describe the strong emotional bond between infant and caregiver, a bond that facilitates a sense of security and trust in the infant (Bowlby, 1982). Attachment theory, developed by Bowlby (1982), describes how, when and why this attachment develops. The theory describes the circumstances that lead to a maladaptive type of attachment, referred to as ‘insecure’ attachment. Bowlby (1982) proposes that infants have a biologically-based attachment system, which monitors the physical proximity of their caregiver. When triggered – perhaps by stress, fear or physical needs (e.g., hunger) – the infant’s attachment system sets off a specific set of behaviours (e.g., crying) to ensure the caregiver remains nearby to meet the infant’s needs. Providing the caregiver responds to the infant’s attachment behaviours in a reliable, consistent, and reassuring way, the infant will develop a secure attachment. Unreliable, inconsistent or neglectful responses from the attachment figure will lead to insecurely attached infants, exhibiting either anxious or avoidant behaviour (Ainsworth, 1978).

Infant attachment behaviours are a stress-response. An infant learns either that their needs will be consistently met, or that they will not. Attachment theory proposes that the infant-caregiver relationship becomes a blueprint for *all* intimate relationships that follow (Bowlby, 1973). Based on the caregiver’s responses to their stress and needs, the infant develops an ‘internal working model’ of relationships. Within these schemas is a representation of the self as either worthy or unworthy within a relationship context, that will persevere into adult life in most cases (Bowlby, 1973).

The notion of ‘relationship blueprints’ explains why some adults appear secure in romantic relationships, and why others appear insecure, anxious and sensitive to

relationship concerns (Bowlby, 1982; Ainsworth, 1978; Fraley, 2002). Adult attachment theorists argue that adult relationships also operate through the attachment system and that the core concepts of the infant-caregiver relationship can be applied to adult romantic relationships (Ainsworth, 1978; Hazan & Shaver, 1987; Fraley, 2010). Although factor analyses of self-report adult attachment measures have identified twelve different adult attachment styles, they map onto two higher-order dimensions of attachment anxiety and avoidance (Brennan, Clark, & Shaver, 1998). Attachment anxiety refers to fear of abandonment by partners, excessive need for approval and distress at any perceived rejection; attachment avoidance refers to fear of intimacy and dependence, and an excessive need for self-reliance (Bartholomew & Horowitz, 1991). Secure adult attachment refers to the absence of attachment anxiety and avoidance. Securely attached adults are comfortable with emotional intimacy, do not worry about being alone or abandoned and are comfortable with appropriate levels of dependence.

Adult attachment has been found to relate to many biopsychosocial phenomena including coping, self-efficacy, well-being, stress response, cortisol response, health behaviours and social functioning (Landen & Wang, 2009; Meredith, Strong & Feeney, 2004; Kidd, Hamer & Steptoe, 2013; Wei, Russell, & Zakalik, 2005; Wu & Yang, 2012).

Attachment and Posttraumatic Stress

There is considerable evidence that higher levels of attachment security are associated with lower levels of PTSS (e.g., Benoit, Bouthillier, Moss, Rousseau, & Brunet, 2010; Declercq & Willemson, 2006; Fraley, Fazzari, Bonanno & Dekel, 2006; Ortigo, Westen, DeFife & Bradley, 2013); and conversely that higher levels of attachment insecurity are associated with higher levels of PTSS (e.g., Currier, Holland

& Allen, 2012; Marmaras, Lee, Siegel & Reich, 2003; O'Connor & Elklit, 2008).

Anxious attachment is more consistently found to relate to PTSS than avoidant attachment, and there is debate over whether avoidant attachment may be protective in certain circumstances (Boegerts, Kunst, & Winkel, 2009; Elklit, Karstoft, Lahav, & Andersen, 2016). Elklit, Karstoft, Lahav, and Andersen (2016) explain the effect of attachment anxiety onto PTSS: “the hyper-activating strategies characterizing attachment anxiety may lead to hypervigilance, intensifying fear-related responses, and rumination on threats, thereby intensifying emotional distress.” In short, and as we might expect, (attachment) anxiety most likely heightens (trauma-related) anxiety. Various mechanisms have been proposed, and tested, to explain the perceived effect of adult attachment on PTSS. There has been some focus on the role of emotion regulation, defined as emotional, cognitive and behavioural strategies used to regulate emotional experience (Benoit et al., 2010, p. 102). In a study of adults recruited in a hospital accident and emergency department, Benoit, Bouthillier, Moss, Rousseau, and Brunet, (2010) found that emotion-focused regulation strategies (e.g., I blame myself for having got into this situation) mediates the relationship between attachment and PTSD. They explain that “a lower level of attachment security would appear to be linked to less optimal emotion regulation strategies, which, in turn, would affect regulation of the initial trauma reaction and contribute to the development of chronic PTSD.” (Benoit, Bouthillier, Moss, Rousseau, and Brunet, 2010, p. 111).

Related to emotion regulation strategies is the role of negative cognitions and appraisals. Arikan, Stopa, Carnelley and Karl (2016) aimed to explain the wide variability in posttraumatic responses by exploring attachment theory alongside Ehlers and Clark's (2000) cognitive model. Using structural equation modelling (SEM) they found that attachment anxiety and negative posttraumatic self-cognitions were

positively associated. Negative posttraumatic self-cognitions were also positively associated with PTSS. Attachment anxiety had an indirect effect (via negative posttraumatic self-cognitions) on PTSS, whereas attachment avoidance predicted more negative posttraumatic world cognitions and lower perceived posttraumatic growth. Similarly, Ogle, Rubin and Siegler (2016) investigated the role of maladaptive trauma appraisals, and found that individual differences in adult attachment systematically influence how individuals evaluate distressing events. Maladaptive trauma appraisals (e.g., the event was appraised as central to their identity and appraised as more severe) mediated the relationship between attachment anxiety and PTSS.

There is also evidence that at least some of the effect of attachment on PTSS may be related to social support. Theoretically we would expect securely attached adults to perceive adequate support and comfortably rely on others to meet their needs, whereas we would expect both anxiously and avoidantly attached individuals to perceive less support and be less able to utilise the available support. There is consistent evidence to support this theory (Besser & Neria, 2012; Florian, Mikulincer & Bucholtz, 1995; Mikulincer, Florian & Weller, 1993; Mikulincer, Shaver, & Pereg, 2003; see also Sharp et al., 2012).

Attachment stability

Despite evidence appearing to support a causal relationship between adult attachment and PTSD, determining causality is problematic. This relates to the issue of attachment stability. Although some studies find adult attachment to be moderately stable over time (Benoit & Parker, 1994; Cozzareli, Karafa, Collins & Tagler, 2003), there is evidence that changing circumstance (Weinfield, Sroufe, & Egeland, 2000), coping style (Zhang & Labouvie-Vief, 2004), a history of depression and/or abuse and

perception of social support relate to attachment change over time (Cozzareli, Karafa, Collins & Tagler, 2003). Cozzareli, Karafa, Collins and Tagler (2003) found that over a two year period 46% of participants changed their attachment style. Stable vulnerability factors (history of depression and/or abuse) related to increases in attachment insecurity, and changes in global constructs of self and other (i.e., increases in self-esteem and perceptions of social support) related to increased attachment security over time. There is some evidence that insecurely attached individuals may be particularly vulnerable to change (Davila, Burge, & Hammen, 1997). Fraley (2002) concludes that attachment stability is relatively constant over the first nineteen years of life. He also highlights the proven influence of early internal working models of relationship on romantic relationships in adulthood.

Social identification: why groups matter

Social identity refers to a person's sense of who they are based on their membership in social groups (Tajfel, 1974). Put simply, a person's social identity is operating when the term "we" or "us" is used instead of "I": "in our family we give to charity", "us veterans have a good work ethic". People generally strive to achieve and maintain a positive sense of self, and one mechanism through which this is achieved is by identifying with groups that make them feel good (Tajfel, 1978). An individual may identify very strongly with being, for example, a nurse, but identify only weakly with being a member of their family. With this example, social identity theory would explain that these differing levels of group identification stem from the individual's evaluation of and emotional attachment to each group, and the situational relevance/salience of the group (Tajfel, 1978). This final point highlights the fact that a group considered salient

one week may not be considered salient the next. For example, if the nurse were to be made redundant, that group's salience immediately wanes.

Social identity theory was extended and refined by self-categorisation theory (Turner et al., 1987). The theory proposes that in any given moment an individual may act differently depending on whether they define themselves as an individual, as a group member, or as a member of the human race. Social identity and self-categorisation theories, collectively termed the 'social identity' approach, have been widely applied and considerable evidence supports them (see Postmes & Branscombe, 2010).

The 'social cure' approach proposes that the combined ideas that people try and increase their positive sense of self through their social identities, and that people's self-categorisation can directly affect their behaviour, have implications for people's health and well-being. Haslam, Jetten, Cruwys, Dingle and Haslam (2018) observe that health is most often studied at the individual level, despite the fact that the groups we are a part of can influence our health behaviours. For example, just as people's places of work provide them with conduct rules (e.g., we do not swear), it may also provide them with health and well-being norms (e.g., we talk about our feelings if we're stressed; we eat a healthy lunch). Well-functioning groups can positively affect health and well-being by providing members of the group not only with norms that guide behaviour, but also with a sense of belonging and a clear self-definition (Jetten, Haslam, & Haslam, 2012). Haslam et al. (2018) suggest various social and psychological resources that flow from a shared identity: feeling connected and positively oriented to others; having meaning and purpose; providing each other with effective social support; developing a sense of control, efficacy and power. These resources, they suggest, are how and why shared identities affect health and well-being. To date, little empirical evidence yet

supports the theoretical mechanisms suggested by the ‘social cure’ approach. This thesis will explore two of the proposed mechanisms – social support and efficacy.

Group identification and health and well-being have been found to be associated in groups of recovering stroke patients (Haslam, Holme, Haslam, Iyer, Jetten & Williams, 2008), the elderly (Gleibs, Haslam, Haslam, & Jones, 2011; Haslam, Cruwys, Milne, Kan, & Haslam, 2016; Haslam, Haslam, Jetten, Bevins, Ravenscroft, & Tonks, 2010), bomb disposal officers, bar staff (Haslam, O’Brien, Jetten, Vormedal, & Penna, 2005), adolescents (Miller, Wakefield, & Sani, 2015); prison guards, family, (Sani, Magrin, Scignaro, & McCollum, 2010), people with multiple sclerosis (Wakefield, Bickley, & Sani, 2013), and women during the transition to motherhood (Seymour-Smith, Cruwys, Haslam, & Brodribb, 2017). To determine the effect of shared identities, well-being measures have been widely used, but clinical measures are also increasingly prevalent and add weight to the utility of the ‘social cure’ approach. Haslam, Cruwys, Milne, Kan and Haslam (2016) conducted two cross-sectional surveys to assess the effect of group ties on cognitive health. Findings support their proposed serial mediation model: an increase in group ties appears to increase strength of group identification, which in turn increases perception of social support, which then appears to increase cognitive health. Wakefield, Bickley and Sani (2013) examined the relationship between support group identification, depression, anxiety, and satisfaction with life in 152 individuals using Multiple Sclerosis support groups. Analyses revealed that support group identification was significantly linked to all outcome measures, over and above the effect of education and age.

Importantly, intervention studies aimed at manipulating group identification to increase health and well-being have been successful (Groups 4 Health; Haslam, Jetten, Cruwys, Dingle and Haslam, 2018). Groups 4 Health (G4H) is a five-module social

identity-derived psychological intervention. It targets the building and maintenance of group membership to support health and well-being. The five modules aim to educate people about how groups can affect their health, and explains how to build new social identities. The program also raises awareness of existing group networks and how to maintain them. The intervention was tested using a non-randomised control design, and delivered to young adults presenting with social isolation and affective disturbance. G4H was found to significantly improve mental health, well-being, and social connectedness, on all measures both at programme completion and at the six-month follow-up. In line with the ‘social cure’ approach, analysis showed that improvements in mental health were underpinned by participants’ increased identification both with their G4H group and other life groups.

Based on the premise that simply being a member of a well-functioning group is enough to impact behaviour, much of the ‘social cure’ research has aimed to observe the positive effect of having group membership alone. For example, Haslam, Holme, Haslam, Iyer, Jetten, and Williams (2008) used their EXITS (Exeter Identity Transitions Scales) measure to examine the effect of group membership change/maintenance on well-being for patients recovering from stroke. Example items: ‘Before my stroke I belonged to lots of different groups’; ‘After my stroke, I continue to have strong ties with the same groups as before my stroke’; ‘After my stroke, I have joined one or more new groups.’ Other studies focus on the effects of varying levels of group identification on health and well-being. For example, Haslam, O’Brien, Jetten, Vormedal, and Penna (2005) used various social identification items to examine the effect of strength of group identification on well-being and mental health. Example items: ‘I identify with my family and friends’; ‘I feel solidarity with my family and friends’; ‘I feel solidarity with my colleagues at work.’ The overarching message – that a shared identity benefits

health and well-being – is clear, but at times the membership/identification distinction is unclear. For the purpose of this thesis, we need to be mindful of the conceptual difference between being a group member and the *process* of identifying with a group. Social identification allows one to access the benefits of being a group member (providing the group is well-functioning). Collapsing membership and identification into one ‘shared identity’ construct will hamper our understanding. We will be left with a term not unlike social support, which often includes antecedents, processes and consequences. This is essentially a methodological issue, and one to be mindful of as we proceed.

Although there is mounting evidence that shared identities can have a positive impact on health and well-being, this is not always the case. Group members can strongly identify with a group because it gives them a positive sense of self (e.g., we’re in a band) and certain group norms can be destructive (e.g., we binge drink when we’re together). This is highlighted here as a cautionary note, and acknowledged by the social cure approach (Haslam et al., 2018). Groups are not beneficial *because* they are groups, they are beneficial only when the benefits outweigh any negative effects on the individual group members.

Within social cure research the idea that groups can be a ‘social curse’ is being formally investigated. Researchers attempt to ascertain under which conditions and circumstances a relationship/group may negatively affect an individual (Kellezi & Reicher, 2012). Kellezi, Bowe, Wakefield, McNamara and Bosworth (2019) interviewed forty immigrants being held in a British immigration removal centre. Detainees were interviewed on topics such as support, identity, and well-being. Thematic analysis was conducted on the interview transcripts. Social identities were found to positively guide exchanges of support, aid meaning making and to mitigate

distrust, and therefore act as ‘social cures’. Conversely, social identities could also be a source of burden, ostracism and distress, and therefore might also serve as ‘social curses’. The shame associated with belonging to a devalued immigrant social group appeared to affect their receipt and perception of support from those outside the detention centre. This finding is supported by previous research that shows that the shame associated with a traumatic event acts as a barrier to help-seeking and help-giving (Kellezi & Reicher, 2012). Kellezi et al.’s research highlights the dynamic relationships between traumatic events, social identities, support and well-being. As social cure research moves forward, ascertaining when, how and why groups may have a negative effect on health and well-being is necessary to fully understand these complex relationships.

Evidence of the mechanisms of group identification

As stated above, in their latest ‘social cure’ publication, Haslam et al. (2018) suggest various social and psychological resources that flow from a shared identity. These are proposed as possible mechanisms of the effect of group identification on health and well-being. Although the individual mechanisms are theoretically sound, to date little direct evidence of the mechanisms appears to exist. Two mechanisms stand out as having some empirical support: social support and personal control/efficacy. Given that low social support is consistently found to be a major risk factor for PTSD (see *Risk and resilience factors*, above), and that perceived lack of self-efficacy in the posttraumatic period has been found to relate to higher PTSS (Benight et al., 2015; Flatten, Walte, & Perlitz, 2008), the ‘mechanisms’ are both of interest to this thesis.

In support of the idea that social support mediates the relationship between group identification and health, Haslam, Cruwys, Milne, Kan, and Haslam (2015)

present two studies of the effect of social relationships on cognitive health. The findings suggest that the benefits of group membership arise from people's capacity to enhance a shared sense of group identification, and that this, in turn, provides the basis for social support. Studies have consistently found that the relationship between higher group identification and higher health and well-being is mediated by social support (e.g., Haslam, O'Brien, Jetten, Vormedal, & Penna, 2005). Haslam et al. (2018) explain that it seems increasingly likely that people who more highly identify with a specific group either *perceive* or *receive* higher levels of social support. Greenaway, Haslam, Cruwys, Branscombe, Ysseldyk, & Heldreth (2015) explore the role of personal control/efficacy as another possible mediator between shared group identity and well-being. Across five studies, perceived personal control mediated 'social cure' effects in political, academic, community and national groups. Greenaway et al. (2015) conclude that the personal benefits of social groups not only stem from making people feel good, but also from their ability to make people feel capable and in control of their lives.

As we present possible mechanisms of group identification, the issue of causation arises. As with all psychological theories, causation cannot be assumed. To illustrate this point, the finding that a strong veteran identity may relate to PTSS does not account for the fact that veterans with high levels of PTSS may more strongly relate to the veteran identity. In terms of both the overall effects of group identification and its possible mechanisms, longitudinal studies are necessary to help ascertain how, why and when group identification is affecting health and well-being, not the other way around.

Group identification and stress appraisals

The transactional model of stress suggests that two types of appraisal determine whether an individual experiences stress in response to a threatening situation (Lazarus and Folkman, 1984). Primary appraisals involve an individual determining if the event itself is a threat (e.g. ‘Is this situation a threat to me?’). Secondary appraisals involve the individual determining if they can cope with the situation (e.g. ‘Can I cope with the situation?’). According to the model, stress will only be experienced if the individual determines that the situation is a threat *and* they do not have the capacity to cope with the situation. Haslam et al. (2018) propose that social identities can affect both the primary and secondary appraisal processes in a variety of ways. They highlight that a wide variety of situations require an individual to assess whether a group they belong to is threatened (e.g. ‘Is this situation a threat to *us*?’). They use the example of soldiers signing up to fight a war because themselves, their families, friends and nation are threatened. Critical to this process is how salient and important the threatened group is to the individual (Haslam et al., 2018). The secondary appraisal process involves an assessment of coping resources and options, and therefore includes an appraisal of social support. Salient social identities can therefore provide a ‘buffer’ to stress by helping an individual consider themselves as part of a well-functioning group and by affecting how they perceive their social support (e.g. Hausser, Kattenstroth, van Dick, & Mojzisch, 2012).

Group identification and Posttraumatic Stress

In support of their ‘social cure’ approach, Haslam et al. (2018) propose that social identity processes are relevant to the development of trauma symptoms. They highlight three key aspects: social identities may shape people’s experience of a

traumatic event; social identities may shape people's appraisal of a traumatic event; and, shared identities are likely to increase/decrease people's perception of support. Aspects of these assumptions are already being explored within the field of traumatic stress (e.g., through the social acknowledgment construct), but the social identity approach offers a neat approach and theoretical underpinning. We can find only a handful of original research papers that have directly examined the effects of group identification on the development of PTSS. Swartzman, Sani, and Munro (2016) compare social support, family identification (a sense of belonging or commonality with family members) and family constraints (the extent to which family members are closed, judgmental, or unreceptive in conversations about cancer) as predictors of PTSS after cancer. They found family identification and family constraints to be stronger predictors of PTSS than social support. In addition, there was a significant indirect effect of identification on PTSS via constraints. The authors conclude that group identification, particularly with family, may be a more important protective factor in a posttraumatic context than social support. Mughal, Carrasco, Brown, and Ayers (2015) assessed an intervention for war trauma in Sierra Leone, and found that PTSS was reduced for participants with a stronger identification with Sierra Leone as a nation. Jones, Williams, Jetten, Haslam, Harris and Gleibs (2012) examined the role of social group membership in reducing PTSS after orthopaedic injuries and acquired brain injuries. The longitudinal prospective study revealed that forming more new group memberships at two weeks after injury, predicted lower PTSS at three months after injury. Although the Jones et al. (2012) study considers membership rather than identification, all three studies support the continued investigation of the role shared identities play in a posttraumatic context.

Also relevant to the study of traumatic stress, are Scringaro, Sani, Wakefield, Bianchi, Magrin, and Gangeri's (2016) findings that posttraumatic *growth* – the positive psychological changes produced by experiencing a traumatic event – predicts higher family identification and identification as a transplantee. Likewise, Kearns, Muldoon, Msetfi, and Surgenor's (2017) finding that following a charity fundraiser for suicide prevention, people who had lost someone to suicide were found to have increased well-being after the event and the effect was mediated by identification with the crowd. Although not directly commenting on the relationship between identification and clinical trauma symptoms, we include both findings as an illustration of the apparent role identification plays in the posttraumatic context, and the theoretical link between recovery/resilience and increased identification.

Seymour-Smith, Cruwys, Haslam and Brodribb (2017) investigate the effect of social identity change on women's mental health in the postpartum period. Given the challenging, and often posttraumatic nature of birth and the immediate postpartum, results are relevant to this thesis. Women who had given birth within the past twelve months ($N = 387$) reported on measures of social group memberships, depression and motherhood identification. Results indicate that a decrease in group memberships, controlling for group memberships prior to birth, was associated with higher depressive symptoms. Maintaining pre-existing group memberships was predictive of better mental health, and identification as a mother was a strong positive predictor of better mental health. New group memberships were not related to depressive symptoms. The study is highlighted not just for these results, which support the continued investigation of social identification in a posttraumatic context, but also because of the researchers' application of the social identity model of identity change (SIMIC). The SIMIC model proposes that because our sense of self is comprised of various social identities, any loss of group

membership will pose a threat to well-being (Jetten, Haslam, & Haslam, 2012). The model illustrates that the effect of childbirth, or indeed any traumatic event, on well-being may be partly down to social identity changes (changes to previous group memberships and the development of new group memberships). The SIMIC model appears to be relevant to this thesis, and draws attention to the issue of social identity *changes* brought about by, or linked to, traumatic events.

Group identification and antecedent factors – attachment

Social identity and self-categorisation theories, and the ‘social cure’ application of these theories, offer relatively little explanation of *when* and *why* identification happens. Based on the principles of comparative and normative fit, they propose that people will chose to identify with a salient group over their own individual identity if the group identity helps them better understand *themselves* in any given situation. This involves the person observing that the differences between themselves and the other group members are small, and that differences between group members and others are relatively large. Further, that the similarities and differences being observed match the individual’s prior expectations. Although this does offer a process observation, from a clinical or health perspective, the explanation is insufficient. This thesis, for example, aims to help ascertain social risk and resilience factors for the development of PTSS. If we consider the process of group identification within this context – the posttraumatic context – the principles they supply do not help us to understand factors that may be antecedent to identification. Which factors might affect the actual process of identification? Which factors could help or hinder the processes of comparative and normative fit evaluation? Haslam et al. (2018) argue that for too long health research has focused solely on the individual, but their assertion that groups must be considered

cannot be undertaken at the expense of the individual. Although the social identity tradition does not deal with individual difference, this thesis proposes that to properly incorporate group identification into the health literature, individual differences must be considered. For clinicians and health researchers individual differences matter greatly, and this thesis proposes that one such individual difference that may be fruitful to explore is adult attachment.

To add support to this proposition, we highlight the finding that attachment has been found to relate to PTSS via posttraumatic cognitions, which are ostensibly social appraisals (Arikan et al., 2016). Further, interpersonal problems (e.g., need for social approval, lack of sociability etcetera) have been found to mediate the relationship between attachment style and suicide-related behaviours (Stepp et al., 2008). Social anxiety has been found to mediate the relationship between adult attachment and depression (Heimberg, Hart, Schneier, & Liebowitz, 2001). Stanton and Campbell's (2014) finding that perceived social support mediates the relationship between attachment anxiety and health outcomes is also noteworthy. These studies support the idea that dispositional adult attachment style is antecedent to, and can affect, social cognition and social processes, which in turn can affect health and well-being.

Rosenthal, Somers, Fleming, and Walsh (2014) explore adult attachment and group identification as predictors of depressive symptoms in a nonclinical sample. Both higher attachment anxiety and avoidance and lower friendship group identification were found to predict lower depression scores. More interesting though, and providing an empirical rationale for future research, they find that group identification partially mediated the relationship between attachment avoidance and depressive symptoms. To explain this finding they highlight previous research suggesting that higher levels of avoidance may be associated with negative appraisals of group members, and the

dismissal of the potential benefits of group interactions (Rom & Mikulincer, 2003). To explain the non-significant anxious attachment to depression via identification result, Rosenthal et al. (2014) refer to a previous experimental study (Crisp et al., 2009). Crisp et al. (2009) found that participants higher in attachment anxiety identified less with a salient in-group after imagining a distressing argument with their partner. They propose this is because anxiously attached individuals will fixate on their romantic partners during times of interpersonal distress, and therefore engage less in the process of group identification. Rosenthal et al. (2014) suggest that the lack of interpersonal distress in the depression study, explains the non-significant relationship between anxious attachment and group identification. However, this explanation is at odds with other studies that find a negative relationship between anxious attachment and various types of social cognition and bonds (e.g., Stanton & Campbell, 2014). This thesis speculates that insecure adult attachment may affect an individual's willingness and confidence to explore (i.e., not feeling they have a 'secure-base' at home), and that this may hamper processes of group identification. Further, the notion of internal working models of the *self* in relation to *others* appears to be relevant here. Perhaps an insecurely attached individual, with an internal schema of their self as unworthy in relation to others, is less willing/able to engage in processes of group identification because of their low self-worth. Despite this thesis' disagreement with Rosenthal et al.'s (2014) and Crisp et al.'s (2009) theoretical explanation, both studies provide a strong rationale for future research examining the relationship between attachment, group identification, and mental health and well-being.

Summary and research questions

The above introduction, relating to how social factors might affect the prevalence and/or development of posttraumatic symptoms, highlights some important areas of research this thesis hopes to address. Since the meta-analytic findings that social support is a core predictor of PTSD, there is a growing body of literature examining the effect of various social factors on PTSS. In the context of building a workable future social model, this thesis aims to re-examine some constructs already highlighted in the field as worthy of investigation – for example, attachment. It also aims to assess theoretically sound new constructs highlighted as worthy of our collective attention – for example, group identification. Examining the relationship between these two constructs is highlighted as a novel, and potentially useful, line of enquiry as we aim to better understand the interaction between individuals, groups and well-being in a posttraumatic context. Building a social model of PTSS requires us to re-examine the social support construct and, in many ways, move past it. Processes thought to be involved in social support – for example, emotional disclosure and social acknowledgment – are highlighted as potentially important to a future model. The unique role of posttraumatic cognitions, given that in many ways they are a form of social appraisal, is also highlighted as worthy of further consideration. Further, given the importance of the event itself in the diagnosis of PTSD, socially relevant event categorisation – for example, the interpersonal/non-interpersonal trauma distinction – is also highlighted as important. With these issues in mind, this thesis aims to examine the following:

1. To investigate the relationship between adult attachment and the development of symptoms of PTSD (chapters 2, 3 and 5).

- 1.1 Systematically examine evidence of the relationship between adult attachment and PTSS (chapter 2).
 - 1.2 Systematically identify which adult attachment categories most greatly affect the development of PTSS (chapter 2).
 - 1.3 Consider the antecedent role of attachment, and its effect on other social factors, in the development of symptoms of PTSD (chapters 2, 3 and 5).
 - 1.4 Consider possible mediators and/or moderators of the relationship between attachment and PTSS (chapters 2, 3 and 5).
2. Examine the role of social factors (e.g., group identification) in a posttraumatic context (chapters 3, 4 and 5)
 - 2.1 Explore the idea that group identification may mediate the relationship between adult attachment and PTSS (chapters 3 and 5).
 - 2.2 Examine possible mediators of the relationship between group identification and PTSS (chapters 3, 4 and 5).
 - 2.3 Propose and examine exploratory social models of posttraumatic stress to help explain symptom variance (chapters 3, 4 and 5).
 - 2.4 Re-examine the social support construct, and consider whether other social factors may have greater explanatory power (chapters 3, 4 and 5).
 - 2.5 Examine posttraumatic cognitions separately to core trauma symptoms to help ascertain their unique relationship with social factors (chapters 3, 4, and 5).

These aims and objectives will be addressed, firstly, through a meta-analytic study of published research on attachment style and PTSD (chapter 2) and then three original research studies (chapters 3-5). The first empirical study (chapter 3) will propose an exploratory social model of PTSS, and test it within a cross-sectional online sample. The second paper (chapter 4) will explore the relationship between group identification and posttraumatic cognitions/symptoms in a small treatment-seeking military sample. The final paper (chapter 5) will examine the relationship between group identification (family and friends vs antenatal group) and posttraumatic cognitions/symptoms and well-being, in a large sample of women before and after birth.

Overview of papers

Paper 1 (chapter 2) presents the findings of a meta-analytic study of the relationship between adult attachment and symptoms of PTSD. The aim of this study was to systematically examine evidence of the relationship between attachment and PTSS, and in doing so determine the magnitude and direction of the effect of different attachment styles onto PTSS. Specifically, the study aimed to ascertain which of the attachment styles and categories most greatly affected symptoms of PTSD. The study also considered proposed mediators/moderators of the relationship, and aimed to systematically examine potential moderators.

Paper 2 (chapter 3) tests an exploratory social model of PTSD within a large online cross-sectional sample. The study hypothesises relationships between interpersonal/non-interpersonal traumatic events, fearful attachment style, emotional disclosure, group identification, social acknowledgement, posttraumatic cognitions and core trauma symptoms. Structural equation modelling (SEM) was used to analyse the final mediation model.

Paper 3 (chapter 4) explores the relationship between veteran group identification, social support, and posttraumatic cognitions and symptoms. Study hypotheses are examined within a ‘hard-to-reach’ treatment seeking sample of veterans with high levels of PTSS. The study aimed to determine whether veteran identification was associated with posttraumatic cognitions/symptoms, and assess the proposition that group identification operates on health and well-being via social support.

Paper 4 (chapter 5) presents a prospective longitudinal study of women attending antenatal groups, with measures taken at the end of pregnancy then approximately eight weeks after birth. The antenatal groups are run by the UK’s largest private provider of antenatal and postnatal courses. The overarching aim of the study was to better understand support in the perinatal period. The study aimed to establish if women’s dispositional attachment style related to PTSS, posttraumatic cognitions, or well-being, via group identification and/or self-efficacy; and whether social support or self-efficacy mediated the relationship between identification and maternal mental health. The study also aimed to establish whether identification with family and friends or identification with the antenatal group related to higher postnatal well-being and mental health.

Chapter 2

The Relationship between Adult Attachment Style and Post-traumatic Stress Symptoms: A Meta-Analysis

Woodhouse, S., Ayers, S., & Field, A. (2015). The relationship between adult attachment style and posttraumatic stress symptoms: a meta-analysis. *Journal of Anxiety Disorders*, 35, 103-117.

Abstract

There is increasing evidence that adult attachment plays a role in the development and perseverance of symptoms of posttraumatic stress disorder (PTSD). This meta-analysis aims to synthesise this evidence and investigate the relationship between adult attachment styles and PTSD symptoms. A random-effects model was used to analyse 46 studies ($N = 9268$) across a wide range of traumas. Results revealed a medium association between secure attachment and lower PTSD symptoms ($\hat{\rho} = -.27$), and a medium association, in the opposite direction, between insecure attachment and higher PTSD symptoms ($\hat{\rho} = .26$). Attachment categories comprised of high levels of anxiety most strongly related to PTSD symptoms, with fearful attachment displaying the largest association ($\hat{\rho} = .44$). Dismissing attachment was not significantly associated with PTSD symptoms. The relationship between insecure attachment and PTSD was moderated by type of PTSD measure (interview or questionnaire) and specific attachment category (e.g. secure, fearful). Results have theoretical and clinical significance.

Keywords: attachment, posttraumatic stress, trauma, social bonds, social cognition, meta-analysis

Introduction

Experiencing a traumatic event is necessary but not sufficient to explain the development of symptoms of posttraumatic stress disorder (PTSD) (American Psychiatric Association, 2013). Multiple factors have been associated with increased risk of PTSD such as a psychiatric history, familial psychiatric history, child abuse, trauma severity, lack of social support, additional life stress and dissociation during the event (Brewin, Andrews & Valentine, 2000; Ozer, Best, Lipsey & Weiss, 2003). This paper considers the possible role of adult attachment in the development of PTSD symptoms.

The importance of social bonds and social cognition in response to traumatic events is increasingly recognised. Social bonds may potentially influence the development and maintenance of PTSD by affecting how an individual processes a traumatic event (Charuvastra & Cloitre, 2008). Various social-cognition models of PTSD have been proposed. Nietlisbach and Maercker (2009) suggest a reciprocal, interactive, concept of social cognition should be integrated into models of trauma processing. Sharp, Fonagy and Allen's (2012) model of PTSD outlines how social bonds and social cognition may contribute to the development of PTSD after a traumatic event. Within their model, social cognition (comprised of various social factors including social support, trust and social acknowledgment) is proposed to mediate the relationship between trauma and PTSD symptoms. Social cognition is founded on early caregiving experiences and attachment schemas; and it is proposed that people with insecure attachment patterns will have compromised mentalising of trauma and therefore be more likely to develop PTSD symptoms (Fonagy & Allen, 2012).

Attachment style is formed in childhood through infant interactions with their primary caregiver. These interactions determine a child's immediate emotional responses to stress and emotion-regulation in later life (Bowlby, 1982). An infant's biologically-based attachment system monitors the proximity of attachment figures, and triggers a set of behaviours in the infant (e.g., crying) designed to increase proximity to the parent/caregiver (Bowlby, 1982). Following activation of this system – perhaps due to stress, fear or a need for sustenance – reliable, consistent, reassuring responses from the caregiver will lead to a 'secure' pattern of attachment behaviour in the infant. Unreliable, inconsistent or neglectful responses from the attachment figure will lead to 'insecurely' attached infants, exhibiting anxious and/or avoidant behavioural styles (Ainsworth, Blehar & Wall, 1978; Cassidy, 1999). Through these interactions, an infant develops an 'internal working model' of relationships (akin to a schema), which enables him/her to regulate, interpret and predict relationship behaviour throughout life (Mikulincer & Shaver, 2007). An adult's attachment style is therefore thought to be founded on the beliefs, expectations and feelings that they learnt as an infant with their caregiver.

Within the field of adult attachment, core concepts of the infant-caregiver relationship have been applied to adult-adult relationships. Most often romantic relationships are considered, although sometimes plutonic peer-peer adult relationships (e.g. Furman, 2001; Roisman, 2006). Research is guided by the underlying assumption that the relationship patterns and motivations within emotionally intimate adult relationships are the same as those observed in infancy. Fraley (2002) suggests that attachment theory offers a coherent and comprehensive explanation of why some adults appear secure and resilient within relationships, and others appear considerably more sensitive to relationship concerns. Hazan and Shaver (1987) found that the distribution

of attachment style categories observed in adulthood is reflective of those observed in infancy: with 56% secure, 24% avoidant, 20% anxious/ambivalent attachments. Adult attachment anxiety refers to a fear of abandonment by partners, an excessive need for approval, and distress at perceived rejection by partners. Attachment avoidance refers to a fear of dependence and intimacy, and an excessive need for self-reliance and avoidance of self-disclosure (Mikulincer, Shaver & Pereg, 2003). Secure adult attachment refers to the *absence* of attachment anxiety and avoidance, in that individuals' do not worry about being alone or being abandoned, and are comfortable with both being dependent on others and having others depend on them (Bartholomew & Horowitz, 1991). Although factor analysis of self-report measures has identified twelve different adult attachment styles, they map onto two higher-order dimensions of attachment anxiety and avoidance (Brennan, Clark and Shaver, 1998).

Various mechanisms of how attachment style relates to PTSD symptoms have been proposed. Dysfunctional hyper-activation or deactivation of emotion regulation strategies are believed to develop in an insecure infant-caregiver attachment relationship (Gerhardt, 2004). The inability to regulate emotions during and immediately after a traumatic event is therefore a potential mechanism through which attachment style may influence the development of PTSD symptoms (Kobak & Sceery, 1988). Similarly, a secure attachment style should result in greater ability to regulate emotions during a traumatic event and be associated with lower levels of PTSD symptoms. There is some evidence to support this hypothesis, showing that emotion regulation strategies mediate the association between secure attachment and lower levels of PTSD symptoms (Benoit, Bouthillier, Moss, Rousseau & Brunet, 2010).

The relationship between adult attachment styles and PTSD symptoms has been examined in many populations, including prisoners of war (Ein-dor, Doron, Mikulincer,

Solomon & Shaver, 2010; Mikulincer, Ein-dor, Solomon & Shaver, 2011), veterans (Harari et al., 2009; Nye, Katzman, Bell, Kilpatrick et al., 2008), security workers (Bogaerts, 2009), those experiencing child abuse (Elklit, 2009; Sandberg, 2010), incest (Alexander, 1998), terrorist attacks (Fraley et al., 2006), childbirth (Iles, Slade & Spiby, 2011), and domestic violence (Scott & Babcock, 2010). Results suggest that secure attachment is associated with low PTSD symptoms (Alexander, 1993; Ghafoori, Hierholzer, Howsepian & Boardman, 2008; Ortigo, Westen, DeFife & Bradley, 2013), and insecure attachment is associated with higher PTSD symptoms (Clark & Owens, 2012; Scheidt et al., 2012; Solomon, Dekel & Mikulincer, 2008). However, a few studies do not find this (Elklit, 2009; Guðmundsdóttir, Guðmundsdóttir & Elklit, 2006) and publication bias may mean other null results have not been published. There is also debate over whether anxious or avoidant attachment styles most relate to PTSD symptoms, with some suggesting that avoidant attachment might protect against elevated levels of PTSD through use of defensive strategies and thought processes (Fraley et al., 2006). However, results are mixed, with some studies finding avoidant attachment more strongly associated with PTSD symptoms than anxious attachment (Frey et al., 2011).

Determining causality in the relationship between adult attachment and PTSD is difficult. Although it may be tempting to conclude that attachment style affects PTSD, research suggests that life events (traumatic or otherwise), or individual differences can change attachment patterns. For example, changing circumstances (Weinfield, Sroufe & Egeland, 2000) and individual characteristics such as defensive coping and perceived well-being (Zhang & Labouvie-Vief, 2004) are associated with changes in attachment style. There is some suggestion that insecurely attached people may be particularly vulnerable to change: whereas secure individuals are likely to remain secure even in the

face of difficult life events (Davila, Burge & Hammen, 1997). Given that traumatic events may be implicated in attachment style change, caution must be taken when attempting to determine a causal relationship between attachment and PTSD.

Despite an increasing number of studies considering the relationship between attachment and PTSD symptoms, results are mixed and often difficult to compare. Some factors have been found to mediate or moderate the relationship between adult attachment and PTSD, such as self-worth (Lim, Adams & Lilly, 2012), social support (Muller & Lemieux, 2000), coping strategies (Gore-Felton et al., 2012) and emotion regulation (Benoit et al, 2010). Ortigo, Westen, Defife and Bradley (2013) highlight the relative lack of empirical examination of the mechanisms linking attachment and PTSD. They propose that object relations (view of self and other) and social cognition should be examined due to their theoretical overlap with attachment, and their correlational study finds a mediating role for both. The current meta-analysis allows us to explore potential moderators of the relationship between attachment and PTSD symptoms.

Despite this growing literature and the potential relationship between attachment and PTSD there has been no previous meta-analytic review of the relationship. This meta-analysis of the relationship between attachment and PTSD symptoms is useful in determining an estimate of the strength of the population effect size, providing a much needed synthesis of the literature, and enabling us to examine the role of potential moderators. It also examines which attachment type (insecure/secure; avoidant/anxious; fearful/preoccupied/dismissing) is most strongly associated with PTSD symptoms.

Method

Selection of studies for the meta-analysis

Database Searches. Combined search terms of *Attachment* AND (*PTSD* OR '*posttraumatic stress*' OR '*traumatic stress*') were searched for in five databases (Pubmed, Psych Info, Medline, Scopus and Web of Knowledge) in August 2013. Where possible, the narrowing criteria of human studies and English Language were applied. 2018 records were returned and transferred to Endnote, which identified 336 duplicates, leaving 1652 papers. Titles and abstracts of all papers were then reviewed, and obviously irrelevant papers (for example, those using a child population, animal studies, literature reviews and individual case reports) were excluded, leaving 101 papers eligible for full-paper review. The search process is shown in Figure 1.

Cited Measures. By searching through the 101 relevant papers returned in the above database searches, and through further consideration of two reviews of adult attachment measures (Crowell & Treboux, 1995; Ravitz, 2010), we located 30 adult attachment measures. Firstly, the original measure development papers for the 30 measures were located within the Web of Knowledge database. Secondly, all papers that referenced one or more of the 30 original measure development papers were located and considered for inclusion in this meta-analysis by searching for the terms *PTSD* OR '*posttraumatic stress*' OR '*traumatic stress*' within their title, abstract and keywords. Following this stage of the search procedure, 2 additional papers were found to be eligible for full paper review.

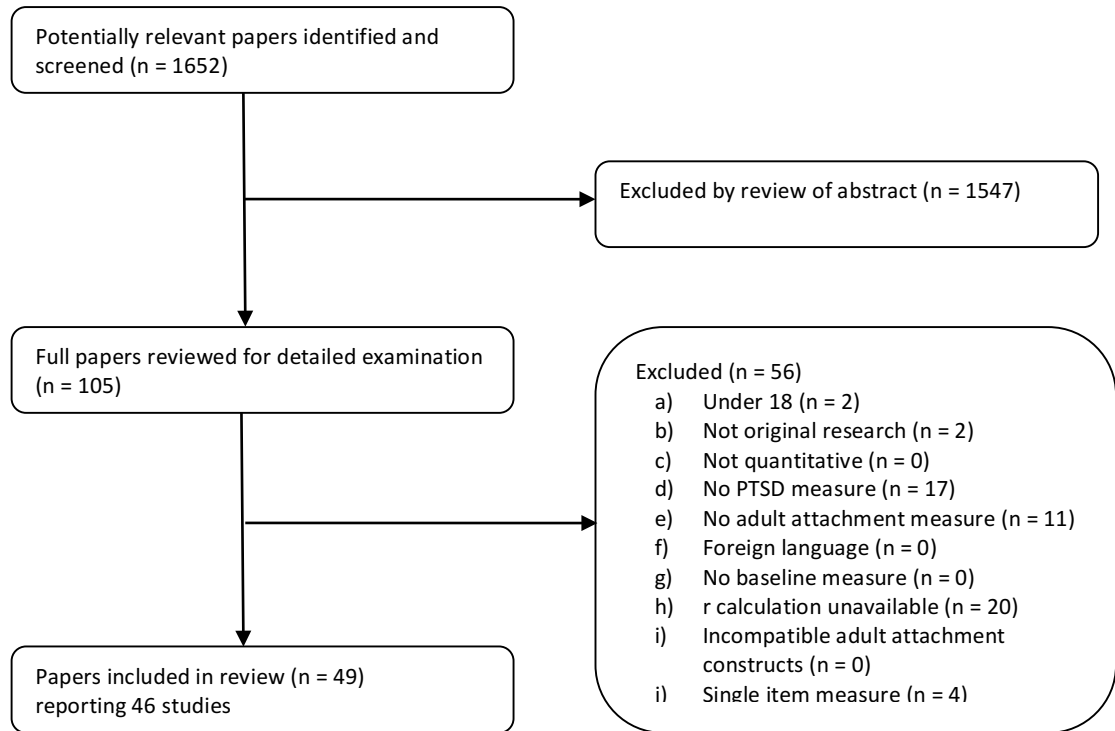


Figure 1. Systematic search flow diagram

Review Papers. The database search returned no meta-analytic or systematic reviews of adult attachment style and PTSD. However, relevant review papers returned in the stage one search (Bakermans-Kranenburg et al., 2009; Cassidy & Mohr, 2001; Charuvastra & Clotre, 2008; Lima et al., 2010; Ravitz, 2010) were examined for empirical papers missed by database searches. No additional papers were found.

Unpublished Papers. Emails were sent to all contactable authors of papers returned in the database searches to request information on unpublished work. Where first author could not be located, the second author was contacted. Thirty-seven authors

were emailed, and 59% replied ($n = 22$). Two relevant unpublished papers were returned.

Following all four stages of the search procedure, 105 papers were deemed eligible for full-paper consideration.

Inclusion and exclusion criteria

The 105 studies were assessed for eligibility using nine inclusion/exclusion criteria (see Figure 1). Papers were excluded if they were studies of children aged under 18 ($k = 2$); were not empirical research ($k = 2$); did not measure PTSD symptoms ($k = 17$) or adult attachment ($k = 11$), or only measured PTSD symptoms or adult attachment with a single item ($k = 4$); or did not report the relevant effect size (correlation coefficient, r), or enough data to calculate this. When this was the case, authors were contacted but if no further data were submitted papers were excluded ($k = 20$). Remaining criteria that did not result in papers being excluded were that studies had to be quantitative and written in English. Treatment studies were only included if adult attachment style and PTSD symptoms were measured before treatment. Adult attachment had to be measured using secure and/or insecure categories/dimensions, compatible with the anxious and avoidant continuum/categories outlined by Bartholomew (1990).

Of the 105 full papers that were read, 56 were excluded based on the above inclusion and exclusion criteria, leaving 49 papers that reported results from 46 research studies for inclusion in the analysis. Where authors published results of one study in two papers, effect sizes were averaged between papers so the study was only entered once into analyses (Alexander 1993; Alexander et al., 1998); or the paper reporting less relevant or detailed information was excluded from analyses (Besser & Neria, 2010;

Muller & Lemieux, 2000). In one case authors reported results for a questionnaire measure of attachment (Alexander 1993) or an interview measure of attachment (Alexander 1998) so effects from both these papers were included in moderator analyses of type of measure. Please note: papers included in the meta-analyses are marked with a * in the reference section.

Coding of Studies

From the 46 studies included in the analysis, various characteristics were identified as potential moderators of the relationship between attachment and PTSD symptoms: i) the type of event experienced, ii) time since the eventⁱ, iii) mean age of participants, iv) gender of participants (entered as a continuous variable based on percentage of males and females), v) marital status of participants (entered as a continuous variable based on percentage married or single), vi) ethnicity of participants (entered as a continuous variable based on percentage of Caucasian participants)ⁱⁱ, vii) type of sample (clinical vs community), viii) type of attachment measure (interview or questionnaire), ix) style of attachment measure (adult attachment measured categorically, or on a continuous *anxious* or *avoidant* scale), x) specific attachment category used (i.e. anxious, preoccupied etcetera) compared to a baseline of secure attachment, xi) posttraumatic stress measure type (interview or self-report), xii) study design (cross-sectional, longitudinal, controlled comparison or intervention), xiii) study quality (0 to 5).

Study quality was determined based on a rating scale modified from Mirza and Jenkins (2004). All 49 papers were assessed based on five criteria: i) explicitly stating study aims, ii) clear inclusion and exclusion criteria for participants, iii) using a validated measure of PTSD symptoms, iv) using a validated AAS measure, v) using

statistical analysis appropriate to study aims and objectives. The studies were then given a total score of quality with the highest possible being five (1 = Yes, 0 = No). Individual study quality ranged from 3 to 5, with a grand mean of 4.10. Encouragingly, 28.57% ($n = 14$) scored 5. Table 1 reports each paper's quality score.

Attachment Categories

Seven attachment styles were drawn from the data supplied by each individual study, leading to seven separate meta-analyses. The use of these 'categories' was determined based: (i) on the categories supplied by the majority of papers and (ii) to ensure compatibility, the application of inclusion criteria that secure and/or insecure categories/dimensions should have been measured.

Firstly, examination of the possible papers indicated that papers within the field overwhelmingly use the continuums (anxious/avoidant) and categories (see below) outlined by Bartholomew (1990), with very few using other categories. Brennan, Clark and Shaver's (1998) factor analysis of all known self-report subscales supports this focus on the anxious/avoidant continuum and, although twelve difference constructs were located within the various measures, all constructs plotted onto the anxious and avoidant dimensions outlined by Bartholomew (1990). This model uses two dimensions (attachment anxiety and attachment avoidance) to determine whether people are high or low anxiety, and/or high or low avoidance. It can be used to produce four categories of adult attachment: secure (low anxiety, low avoidance), dismissing-avoidant (low anxiety, high avoidance), preoccupied (high anxiety, low avoidance), fearful-avoidant (high anxiety, high avoidance) (Bartholomew & Horowitz, 1991).

As well as being used to categorise each individual participant into a specific attachment style, the model can be used to produce a continuous score on the two scales

(attachment anxiety and attachment avoidance). Rather than determining whether a participant is categorised as secure, dismissing, preoccupied or fearful, participants instead are given two continuous scores: anxious and avoidant. Additionally though, the anxious and avoidant scores often lead to participant categorisation (as *either* anxious or avoidant). Further, the model can be used to determine whether someone is securely or insecurely attached – with all insecure categories (anxious, avoidant, dismissing, preoccupied, fearful) considered as one homogenous ‘insecure’ group based on the presence of attachment anxiety or avoidance. To be clear, not all papers in the meta-analysis used the Bartholomew *measure*, but papers did have to use the same *constructs* to be included in the meta-analysis.

Based on the above, the following seven attachment styles were used within the meta-analysis: secure, insecure, anxious, avoidant, dismissing, preoccupied, fearful. Table 1 (column 1) details each separate meta-analysis that data from individual studies contributed to. Studies tend to use *either* the anxious/avoidant constructs or the secure/dismissing/preoccupied/fearful constructs. The vast majority of studies ($k = 45$) were included within the overall insecure meta-analysis, with data drawn from all of the insecure attachment styles (anxious, avoidant, dismissing, preoccupied, fearful) or, where supplied, the papers own insecure attachment effect size (e.g. Bogaerts et al., 2008).

Computation and Analysis of Effect Size

Meta-analyses were conducted using the metafor package (Viechtbauer, 2010) for R (R Core Team, 2013). Pearson’s correlation coefficient, r , was chosen as the effect size because, firstly, within our study sample r was the commonly reported effect size and, secondly, r is easily computable from chi-square, t , F and d (Hunter &

Schmidt, 2004). Where attachment was measured categorically, correlation coefficients were computed so that a positive coefficient represented a lower mean PTSD symptoms in the secure group than the insecure group(s), and a negative coefficient reflected a secure group with a higher level of PTSD symptoms than the insecure group(s). For continuous data, positive coefficients represented a lower level of PTSD symptoms, and negative coefficients represented a higher level of PTSD symptoms. Where studies reported multiple effect sizes for a given study question (e.g., several r s quantifying the association between avoidant attachment and PTSD symptoms), these effect sizes were aggregated within studies to insure that effect sizes in the meta-analysis were independent (Borenstein, Hedges, Higgins, & Rothstein, 2009; Cooper, 2010; Hunter & Schmidt, 2004).

As reported in Table 2, seven meta-analyses were conducted using the different attachment categories. All individual effect sizes from all studies were, firstly, determined to be either ‘insecure and PTSD’ or ‘secure and PTSD’. Effect sizes from 45 of the 46 studies are included in the meta-analysis of insecure attachment on overall PTSD symptoms (Figure 2). The meta-analysis of insecure attachment on PTSD symptoms can be taken as the ‘main effect’ because it includes the vast majority of studies. Only one study (Benoit et al., 2010) reported *only* attachment security, and is therefore not included in the insecure main effect size. The effect size from Benoit et al. (2010) is instead included in the meta-analysis of secure attachment on PTSD symptoms, along with 10 other studies which also report secure attachment (Figure 3). Secondly, all effect sizes from the 45 studies reporting the relationship between insecure attachment and PTSD symptoms were, where explicitly stated, categorised as either anxious or avoidant attachment. Meta-analysis of anxious attachment on overall PTSD symptoms includes individual effect sizes from 28 studies. Meta-analysis of

avoidant attachment on overall PTSD symptoms includes individual effect sizes from 26 studies. Thirdly, all insecure effect sizes were, where possible, further broken down into attachment sub-types fearful (Figure 4), dismissing and pre-occupied, and overall PTSD symptoms. For a full explanation of attachment categorisation, please see 2.1.4.

Method of Meta-analysis

Broadly speaking there are two conceptualisations of meta-analysis: the fixed-effects model (Hunter & Schmidt, 2004) and random effects model (Hedges & Vevea, 1998). There is a strong argument that the random-effects model is more appropriate for social science data (Field, 2005; Field & Gillett, 2010) because variability of effect size is the norm. Therefore, a random-effects model, using Hedges and Vevea's (1998) method and the DerSimonian-Laird estimator of heterogeneity (DerSimonian & Laird, 1986) was applied. Moderator analysis was also conducted using a random-effects general linear model (or 'meta-regression' as it is sometimes labelled), and all moderators were examined separately.

Table 1

Characteristics of studies

Study	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
meta-analyses study included in											
Alexander (1993) ^a Sec, Insec, Dismiss, Fear, Preocc	112	Child sexual abuse (incest)	30.4 years (<i>M</i>)	37	100% female		85% Caucasian	RQ (Bartholomew & Horowitz, 1991)	IES (Horowitz et al., 1979)	C.S.	3
Alexander et al., (1998) ^a Insec, Dismiss, Fear, Preocc	92	Child sexual abuse (incest)	30.4 years (<i>M</i>)	37	100% female		85% Caucasian	FA Interview* (Bartholomew & Horowitz, 1991)	IES (Horowitz et al., 1979)	C.S.	4
Benoit et al., (2010) Sec	36	Various (hospital emergency admissions)	4 - 12 weeks	33	44.4% female	61% married/ cohabit.		AAP Interview* (George et al., 1997)	IES-R (Weiss & Marmar, 1997)	L.	5

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Besser & Neria (2010) ^b	135	Missile fire	4 months	23.85	84% female			ECR-R (Fraley et al., 2000)	PTSD-I (Solomon et al., 1994)	L.	4
Besser & Neria (2012) Insec, Anx, Avoid	135	Missile fire	Ongoing	23.85	84% female			ECR-R (Fraley et al., 2000)	PTSD-I (Solomon et al., 1994)	C.S.	4
Besser et al., (2009) Insec, Anx, Avoid	562	Missile fire	Ongoing (< 7 years)	33.68	53.6% female			ECR-R (Fraley et al., 2000)	IES-R (Weiss & Marmar, 1997)	C.C.	5
Boelen (2012) Insec, Anx, Avoid	176	Bereaved	4.8 months (M)	45	87.5% female			RQ (Bartholomew & Horowitz, 1991)	PSS-SR (Foa et al., 1993; Engelhard et al., 2007)	L.	4

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Bogaerts et al., (2009) Insec	79	Physical violence / aggression	< 1 year	42.2	100% male	53% married		RQ (Bartholomew & Horowitz, 1991)	DTS (Davidson et al., 1997)	C.S.	3
Bogaerts et al., (2008) Insec	212	Physical violence / aggression	< 6 months	42.2	100% male	53% married		RQ (Bartholomew & Horowitz, 1991)	DTS (Davidson et al., 1997)	C.C.	4
Clark & Owens (2012) Insec, Anx, Avoid	116	Combat	Ongoing – 12 years	35	81% male		88% Caucasian	ECR-S (Wei et al, 2007)	PCL-M (Weathers et al., 1993)	C.S.	4

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Cohen et al., (2002) Insec, Avoid	134	Holocaust	>50 years	60	54% female	85% married		AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994); IES (Horowitz et al., 1979)	C.C.	4
Cohen et al., (2011) Insec, Anx, Avoid	477	Combat	2 – 28 years	47.3	100% male	96.5% married		ECR (Brennan et al., 1998)	PTSD-I (Solomon et al., 1994)	C.C.	4
Currier et al., (2012) Insec, Fear, Preocc	157	Combat	1.8 - 11 years	35.9	91.4% male	49% married	61.6% Caucasian	ECR-R (Fraley et al., 2000)	PCL-C (Weathers et al., 1993)	C.S.	4

Table 1 Continued

[illegible]

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Dieperink et al., (2001) Insec	107	War captivity	>50 years	75.4		84% married		RQ (Bartholomew & Horowitz, 1991)	PCL-M (Weathers et al., 1993)	C.S.	4
Ein-Dor et al., (2010) Insec, Anx, Avoid	314	War captivity	37 years	53.37	50% female	100% married/co habiting		AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994)	C.C.	4

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Elklit (2009)	69	Child	26.7 years	33.3	100%	50%	100%	RAAS	HTQ (Mollica	I.	4
Insec, Anx,		sexual	(<i>M</i>)		female	married/c	Caucasian	(Collins &	et al., 1992)		
Avoid		abuse				ohabiting		Read, 1990; Collins, 1996)			
Elwood et al., (2007)	287	Interperson al trauma		20.18	76%		89%	ECR	PPTS-R	C.S.	4
Insec, Anx,					female		Caucasian	(Brennan et	(Lauterbach &		
Avoid								al., 1998)	Vrana, 1996)		

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Escolas et al., (2012) Insec, Dismiss, Fear, Preocc	561	Combat	1 month – 14 years		71.8% male	69% married/co habiting	65.6% Caucasian	RQ (Bartholomew & Horowitz, 1991); ECR- R (Fraley et al., 2000)	PCL-M (Weathers et al., 1993)	C.S.	5
Forbes et al., (2010) Sec, Insec, Dismiss, Fear, Preocc	103	Combat	35 – 54 years	53.3	100% male			RSQ (Griffin & Bartholomew, 1994)	PCL-M (Weathers et al., 1993)	I.	3

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Fraley et al., (2006) Insec, Anx, Avoid	45	Sept. 11 th , attack on WTC in U.S.A.	7 months – 18 months	39			84.4% Caucasian	RSQ (Griffin & Bartholomew, 1994)	PSS-SR (Foa et al., 1993)	L.	4
Frey et al., (2011) Insec, Anx, Avoid	40	Combat		28.5	50% female	100% married	75% Caucasian	ECR (Brennan et al., 1998)	PCL-M (Weathers et al., 1993)	C.S.	4
Ghafoori et al., (2008) Sec, Insec	102	Combat	33 – 52 years (86%)	56		52% married/co habiting	58% Caucasian	RSQ(Griffin & Barth., 1994); ECR- R (Fraley et al., 2000)	CAPS (Blake et al., 1998)*	C.S.	5

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Gore-Felton et al., (2013) Sec, Insec, Anx, Avoid	94	Various (HIV/AIDS sample)		39.7	62.8% female	46.8% single	52% Caucasian	Three- category measure (Hazan & Shaver, 1987)	PCL-C (Weathers et al., 1993)	C.S.	5
Guðmundsdóttir et al., (2006) Insec, Anx	105	Terminal illness (parents of child)		35.7	63% female			RAAS (Collins & Read, 1990; Collins, 1996)	HTQ (Mollica et al., 1992)	C.S.	4
Harari et al. (2009) Insec	60	Combat		34.6				AAI (Main et al, 2003)*	CAPS (Blake et al., 1998)*	C.C.	4

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Iles et al. (2011)	372	Birth	7 weeks – 3 months	33	50%	100%		ECR-R	PTSD-Q	L.	5
Insec, Anx, Avoid					female	married/co habiting		(Fraley et al., 2000)	(Watson et al., 1991)		
Lim et al. (2012)	228	Various		19.64	66.7%		68.9%	ECR-R	PDS (Foa et al., 1995)	C.S.	4
Insec, Anx, Avoid		(interp. vs non-interp.)			female		Caucasian	(Fraley et al., 2000)			

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Marmaras et al. (2003) Sec, Insec, Dismiss, Fear, Preocc	375	Vicarious Traumatizatio n (trauma therapists)			100% female		93.6% Caucasia n	RQ (Bartholomew & Horowitz, 1991)	IES-R (Weiss & Marmar, 1997)	C.S.	4
Mikulincer et al. (2011) Insec, Anx, Avoid	321	War captivity	18 – 35 years	57				AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994)	L.	4
Mikulincer et al. (1993) Insec, Anx, Avoid	140	Missile fire	2 weeks		68.6% female			AASQ (Mikulincer et al., 1990)	IES (Horowitz et al., 1979; Schwarzwald et al, 1987)	C.S.	3

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Mikulincer et al. (1999) Sec, Insec, Anx, Avoid	80	'Terrorist' attacks		30 (<i>Mdn</i>)	60% female	61% married		AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994); IES (Horowitz et al., 1979; Schwarzwald et al, 1987)	C.C.	4
Muller & Lemieux (2000a) ^b	66	Child abuse		33	63.6% female		61% Caucasian	RSQ (Griffin & Bartholomew, 1994)	PTSD-C (Southwick et al., 1993)	C.S.	5

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Muller et al. (2000b) Insec, Dismiss, Fear, Preocc	66	Child abuse		33	63.6% female	62% single	61% Caucasian	RSQ (Griffin & Bartholomew, 1994)	PTSD-C (Southwick et al., 1993)	C.S.	5
O'Connor & Elklit (2008) Insec, Dismiss, Fear, Preocc	328	Various (student sample)		29.2	65% female	48% single		RAAS (Collins & Read, 1990; Collins, 1996)	HTQ (Mollica et al., 1992)	C.S.	4
Ortigo et al (2013) Sec, Insec, Dismiss, Preocc	263	Various (hospital admissions)						AAPQ (Westen & Nakash, 2005)	PSS (Falsetti et al., 1993)	C.S.	4

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Renaud (2008)	49	Combat	33-52 years	57.4	100%	55.1%		Three-	Mississippi	C.S.	4
Insec, Anx, Avoid			(81.6%)		male	married		category measure (Hazan & Shaver, 1987); ECR (Brennan et al., 1998)	Scale (Keane et al., 1988)		
Riggs et al. (2007)	80	Child abuse		36.56	92.5%	38.8%	81.3%	ECR	MCMI-III	C.S.	5
Insec, Anx, Avoid					female	married	Caucasian	(Brennan et al., 1998)	(Million, 1994)		

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Sandberg (2010a)	199	Various		19	100%	85% single	30%	RQ	PCL-C	C.S.	3
Sec, Insec, Dismiss, Fear, Preocc		(child & adolescent abuse		(<i>Mdn</i>)	female		Caucasian	(Bartholomew & Horowitz, 1991)	(Weathers et al., 1993)		
Sandberg et al.	224	Various		21.73	100%	79% single	30%	ECR	PCL-C	C.S.	4
(2010b)		(college			female		Caucasian	(Brennan et	(Weathers et al.,		
Insec, Anx, Avoid		sample)						al., 1998)	1993)		

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Scheidt et al. (2012) Sec, Insec, Dismiss, Preocc	31	Perinatal loss	4 weeks – 9 months	35.19	100% female	74.2% married		AAI (Main et al, 2003)*	PDS (Foa et al., 1995; Steil et al., 2000)	L.	5
Schiff & Levit (2010) Insec, Anx, Avoid	95	Various (methadone patients)		39.35	100% female			ECR (Brennan et al., 1998; Mikulincer, 1998)	PDS (Foa et al., 1995)	C.S.	4
Scott & Babcock (2010) Insec, Anx	174	Intimate partner violence		30.11	100% female			AAS (Collins & Read, 1990)	PDS (Foa et al., 1995)	C.S.	5

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Solomon et al. (2008) Insec, Anx, Avoid	209	War captivity	18 years - 30 years					AASQ (Mikulincer et al., 1990)	PTSD-I (Solomon et al., 1994)	L.	5
Solomon et al. (1998) Insec, Anx, Avoid	348	War captivity	18 years	40 (M)		26% married		AASQ (Mikulincer et al., 1990)	IES (Horowitz et al., 1979); PTSD-I (Solomon et al., 1994)	C.C.	5
Woodward et al. (2013) Insec, Anx	108	Intimate partner violence		36.6	100% female		56.5% Caucasian	RAAS (Collins & Read, 1990; Collins, 1996)	CAPS (Blake et al., 1995)*	C.S.	5

Table 1 Continued

	N	Trauma/ event	Time since trauma	Mean age	Sex	Relation- ship	Ethnicity	Attach. measure *interview	PTSS measure *interview	Study design	Study quality
Zerach et al. (2014)	156	Secondary		57.9	100%	100%		AASQ	PTSD-I	C.S	N/A
Insec, Anx, Avoid		traumatizatio n (wives of former POWs)			female	married		(Mikulincer et al., 1990)	(Solomon et al., 1994)		

Note: All studies included in the meta-analysis are marked with * in the reference section. Column 1 includes detail of each separate meta-analysis (Secure, Insecure, Anxious, Avoidant, Dismissing, Fearful, Preoccupied) that data from the study contributed to. Study design abbreviations are Cross Sectional (C.S.), Longitudinal (L.), Controlled Comparison (C.C.) and Intervention (I.)

^a These papers report results from the same study so effect sizes were averaged for the main analyses.

^b Results from these papers were excluded from analyses because findings are reported in another paper already included in analyses

Results

Study Characteristics

Details of relevant study characteristics from individual studies are reported in Table 1. Within the 46 studies included in the meta-analysis, sample size of individual studies ranged from 31 to 561, with a total of 9268 participants. The majority of studies ($k = 39$) provided data on the mean (or median) age of participants, which ranged from 19 to 75.4, with a grand mean of 38.39. Of the 18 studies that reported sample ethnicity, 16 used a predominantly Caucasian sample. Females were also over-represented within the studies, with 56% ($k = 26$) comprised of more than 50% females. Only 25 studies provided participant marital status, and the majority of these used a predominantly (>50%) married/co-habiting sample ($k = 16$). The majority of studies ($k = 37$, 80.43%) used a community rather than clinical sample.

A high proportion of studies ($k = 17$, 36.96%) used a military sample, with 10 studies examining the experience of combat and 7 the experience of war captivity. Nine studies used samples that had experienced various/mixed traumasⁱⁱⁱ (19.56%), and 5 studies used samples whose primary traumatic event was either child sexual abuse (CSA) or child abuse (10.87%). Six studies examined participants who had experienced a 'terrorist attack' (13.04%), and 4 of physical violence/aggression (8.70%). The remaining 7 studies considered traumatic events not examined by other studies in the meta-analysis, for example, one study assessed participants who had experienced The Holocaust.

Only 26 studies (56.52%) reported the time that had elapsed since the event took place, or enough information about the event to calculate mean time since trauma. The length of time between the event and measurement of participant symptoms ranged

from 1 month to over 50 years. Of the studies that supplied time since trauma data, 9 studies (34.62%) examined a sample that had experienced the traumatic event within the previous year. Two studies (7.69%) assessed a sample whose trauma had taken place between 1 and 5 years previous, 1 study (3.85%) between 10 and 20 years previous, 2 studies (7.69%) between 20 and 30 years previous, 8 studies between 30 and 40 years previous and 4 studies examined samples whose trauma had taken place over 50 years previous.

The majority of studies were cross-sectional ($k = 27$, 58.70%), with 9 controlled comparison (19.57%), 8 longitudinal (17.39%) and 2 interventions (4.35%). A wide range of adult attachment measures were used throughout the 46 studies, the majority of which measured adult attachment within adult romantic relationships; although some used composite measures that derived adult attachment from past family attachment patterns (e.g. the Adult Attachment Interview; George, Kaplan, & Main, 1985). The most widely used measures were the Adult Attachment Scale (AAS; Mikulincer et al., 1990) ($k = 10$, 21.74%) and the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991) ($k = 9$, 19.57%). A wide range of PTSD measures were also used, with the majority using the PTSD Inventory (PTSD-I; Solomon, Neria, Ohry, Waysman et al., 1994) ($k = 10$, 21.74%). Measures used by individual studies are reported in Table 1.

Attachment and posttraumatic stress

Results of the meta-analyses for each of the seven attachment sub-types on PTSD symptoms are presented in Table 2. This table shows the number of studies included in each meta-analysis (k), the estimate of between study variability (τ^2), test of

significance of between study variance (Q), the population effect size estimate ($\hat{\rho}$) and adjusted effect size estimate, and 95% Confidence intervals.

Insecure and secure attachment

The forest plot for insecure attachment (Figure 2) shows that mean effect sizes for individual studies ranged from $\hat{\rho} = -.36$ (Guðmundsdóttir et al., 2006) to $\hat{\rho} = .91$ (Currier et al., 2012). 91% of effect sizes lie between $\hat{\rho} = -.05$ and $\hat{\rho} = .57$ showing that both Guðmundsdóttir et al. (2006) and Currier et al. (2012) are exceptions in the strength of effect size compared to other studies. The overall population effect size was a modest $\hat{\rho} = .26$ (Table 2).

The forest plot for secure attachment (Figure 3) shows mean effect sizes for individual studies ranging from $\hat{\rho} = -.10$ (Declercq & Willemsen, 2006) to $\hat{\rho} = -.64$ (Mikulincer et al., 1999). The overall population effect size was a modest $\hat{\rho} = -.27$ (Table 2).

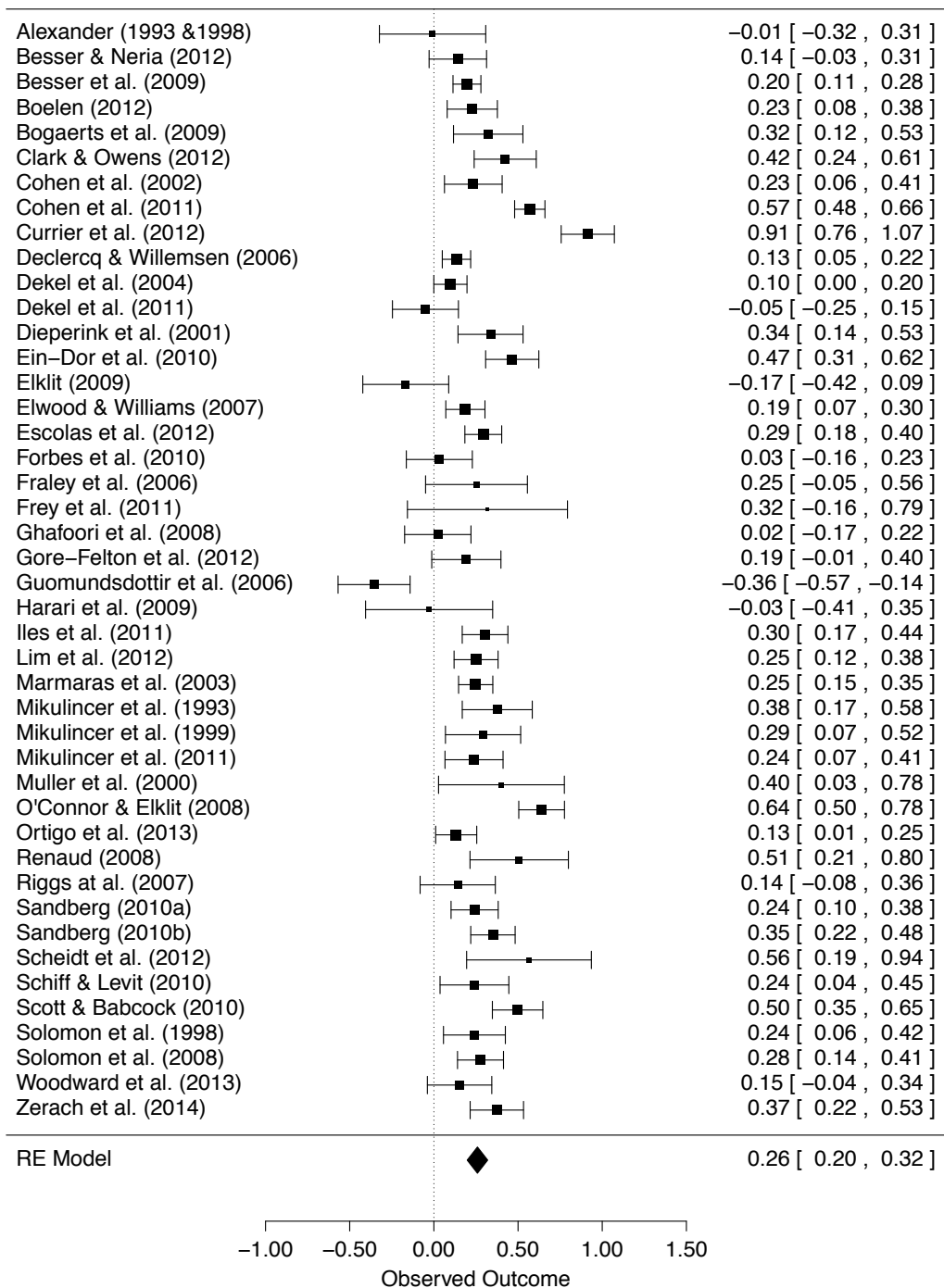


Figure 2. Forest plot of studies reporting the relationship between *insecure* attachment and PTSD symptoms: overall effect size, their confidence interval and the range of effect sizes within each individual study are reported.

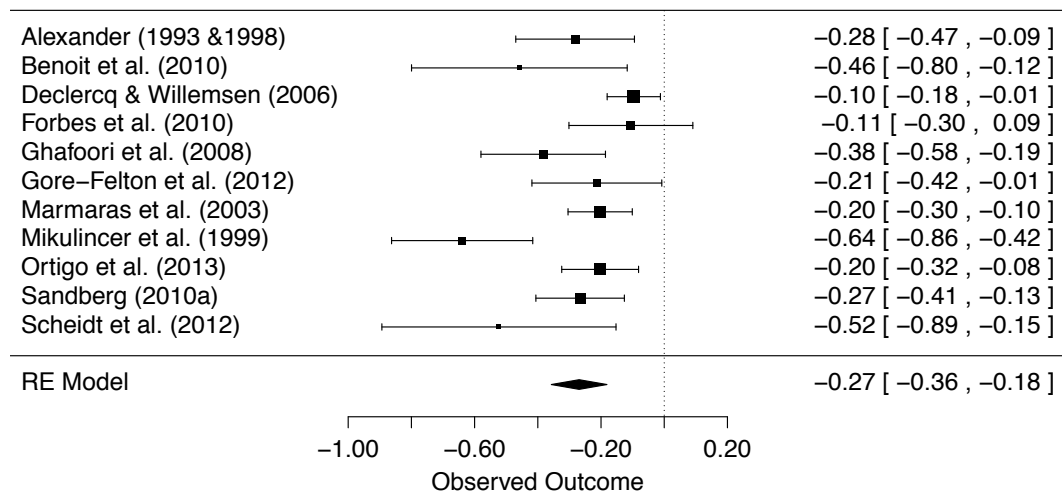


Figure 3. Forest plot of studies reporting the relationship between *secure* attachment and PTSD symptoms: overall effect size, their confidence interval and the range of effect sizes within each individual study are reported.

Table 2

Individual meta-analyses of attachment type on overall PTSD symptoms

Attachment type	k	τ^2	Q	$\hat{\rho}$	Adjusted $\hat{\rho}$	95% CI	
						Lower	Upper
Insecure	44	0.033	272.70***	.259***	.218	.198	.320
Secure	11	0.013	31.19**	-.269***	-.244	-.357	-.181
Anxious	28	0.033	171.27***	.257***	.218	.180	.333
Avoidant	26	0.024	123.42***	.243***	.210	.174	.313
Dismissing	10	0.072	139.99***	.163	.135	-.016	.342
Fearful	9	0.068	122.77***	.444***	.394	.264	.624
Preoccupied	11	0.027	60.97***	.307***	.276	.193	.421

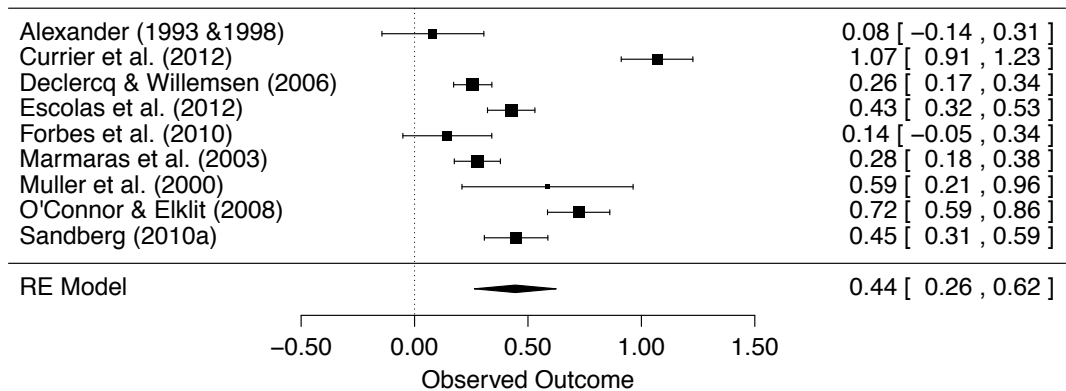
Note. *** = $p < .0001$, ** = $p < .0005$ 

Figure 4. Forest plot of studies reporting the relationship between *fearful* attachment and PTSD symptoms: overall effect size, their confidence interval and the range of effect sizes within each individual study are reported

Anxious and avoidant attachment

Anxious attachment effect sizes ranged from $\hat{\rho} = -.36$ (Guðmundsdóttir et al., 2006) to $\hat{\rho} = .59$ (Cohen et al., 2011). The overall population effect size was a modest $\hat{\rho} = .26$ (Table 2). For avoidant attachment effect sizes ranged from $\hat{\rho} = -.10$ (Dekel et al., 2011) to $\hat{\rho} = .69$ (Renaud, 2008). Multiple studies returned an effect size (or average effect size) of .0, meaning no or very little effect was detected. The overall population effect size was a modest $\hat{\rho} = .24$ (Table 2).

Dismissing, fearful and preoccupied attachment

The forest plot for fearful attachment (Figure 4) shows that effect sizes ranged from $\hat{\rho} = -.05$ (Alexander, 1993) to $\hat{\rho} = 1.07$ (Currier et al., 2012). The population effect size estimate for fearful attachment was larger than for other attachment styles, $\hat{\rho} = .44$ (Table 2). For preoccupied attachment effect sizes ranged from $\hat{\rho} = -.17$ (Alexander, 1993) to $\hat{\rho} = .76$ (Currier et al., 2012) with a population effect size estimate of $\hat{\rho} = .31$ (Table 2). For dismissing attachment effect sizes ranged from $\hat{\rho} = -.14$ (Alexander et al., 1998) to $\hat{\rho} = .84$ (O'Connor & Elklit, 2008) with a non-significant population effect size of, $\hat{\rho} = .16$ (Table 2).

Moderator Analysis

All homogeneity tests (τ^2 , Q) indicated significant between-study variability in effect sizes ($p < .0005$, Table 2). Large variation in effect size can be seen within or between the insecure, avoidant, fearful and preoccupied meta-analyses. Although a small number of studies have supplied the outlying effect sizes, it is important to examine factors that moderate these relationships, as these results feed directly into the main 'insecure' meta-analysis. The vast majority of studies ($k = 45$) contributed to the

overall effect size of insecure attachment and PTSD symptoms. As the largest of the meta-analyses, moderator analyses were performed on insecure attachment. Thirteen sample and study characteristics that may explain the significant variance of individual study effect size were examined separately to see if they moderated the relationship between insecure attachment and PTSD symptoms.

Sample characteristics

No sample characteristics were found to significantly moderate the relationship between insecure attachment and overall PTSD symptoms: gender ($p = .495$), marital status ($p = .090$), trauma type ($p = .668$), clinical or community sample ($p = .978$), and time since trauma greater or less than 10 years ($p = .811$) and ethnicity ($p = .310$).

Study characteristics

Categories of study design did not significantly moderate the relationship between insecure attachment and overall PTSD symptoms ($p = .179$). Importantly, study quality did not significantly predict strength of effect size ($p = .751$). Type of attachment measure (interview vs questionnaire) did not significantly moderate the relationship ($p = .708$). Attachment measure (adult attachment measured categorically, or on a continuous *anxious* or *avoidant* scale) did not significantly moderate the relationship, although the significance value is borderline ($p = .083$).

Type of PTSD measure was found to significantly moderate the relationship between insecure attachment and overall PTSD symptoms ($\chi^2(1) = 6.44$, $\beta = -.28$, $p = .0112$), indicating that the mean effect size for each group was significantly different from their comparison group. Studies using self-report measures of PTSD symptoms, $\hat{\rho}$

= .28, demonstrate a stronger relationship between insecure attachment and PTSD symptoms than those using interview measures of PTSD, $\hat{p} = -.005$. Of note though, only three studies used interview measures of PTSD.

Attachment categories as moderators

Using secure attachment style as baseline, specific attachment categories were found to significantly moderate the relationship between insecure attachment and overall PTSD symptoms ($\chi^2(6) = 74.21, p < .0001$). Results reveal the relative strength of the relationship between each attachment category and PTSD symptoms, compared to the relationship between secure attachment and PTSD symptoms. Compared to secure attachment, fearful attachment demonstrated the strongest relationship ($\beta = .73, p < .0001$), followed by the preoccupied attachment category ($\beta = .59, p < .0001$), and then the anxious attachment category ($\beta = .54, p < .0001$). The avoidant attachment category ($\beta = .53, p < .0001$) and the dismissing attachment category demonstrated the weakest relationship ($\beta = .45, p < .0001$). The insecure category itself was found to have a lower beta than the fearful, preoccupied and anxious categories ($\beta = .47, p < .0001$).

Publication Bias

Publication bias refers to the decision to publish a paper based on the results of that paper rather than basing the decision on the overall standard of research (Rosenthal, 1979). The biasing effect is seen when papers that report non-significant results are not published, whilst those with significant findings are. Publication bias can exert a substantial influence on meta-analytic reviews (Field & Gillett, 2010) given that published (rather than unpublished) results tend to be included in the synthesis.

To quantify the likely effect of publication bias, a sensitivity analysis based on Vevea and Woods (2005) was conducted which adjusts the population effect size estimate for moderate and severe one- and two-tailed selection bias. This was done using Vevea and Woods' (2005) scripts for S-plus adapted for R. Table 2 includes estimates of the population effect adjusted for severe two-tailed publication bias. Of course, all the adjusted values are smaller than the actual estimates reflecting the downward effect that publication bias has on the population effect size estimate. However, all adjusted effect sizes were broadly similar in size to the unadjusted values (in terms of the substantive size of effect). These results indicate that the broad conclusions drawn from the analysis are the same when correcting for publication bias.

Discussion

The meta-analyses found that secure attachment is associated with lower levels of PTSD symptoms following trauma, and insecure attachment is associated with higher levels of PTSD symptoms. These findings are consistent with results of individual studies (Alexander, 1993; Ghafoori, Hierholzer, Howsepian & Boardman, 2008; Scheidt et al., 2012; Solomon et al., 2008) and provide estimates of the overall strength of these associations. Insecure attachment sub-types (anxious/avoidant; fearful, preoccupied) were significantly associated with elevated PTSD symptoms but demonstrated fairly modest population effect size estimates. Dismissing attachment had a small, non-significant effect. Fearful attachment style was most strongly associated with PTSD symptoms. The relationship between insecure attachment and PTSD symptoms was significantly moderated by type of PTSD measure, with self-report measures demonstrating a stronger relationship with attachment than interview measures.

As expected, specific attachment category (using secure attachment as a baseline) significantly moderated the relationship between attachment style and PTSD symptoms. The relative importance of different types of insecure attachment is debated within the attachment literature; therefore, this finding and the results of the seven main meta-analyses highlight the importance of studying the different insecure attachment categories.

There is debate within the literature about the role of avoidance in the onset and perseverance of PTSD symptoms (for a summary see Fraley et al., 2006). This meta-analysis found the population effect size for avoidant attachment on PTSD symptoms is modest ($\hat{\rho} = .24$), but nevertheless shows that an avoidant attachment style is associated with elevated levels of PTSD symptoms following trauma. Kobak and

Sceery (1988) propose that each attachment style relates to distinct patterns of negative affect regulation, with avoidant individuals tending to cut-off from anger and distress, restricting acknowledgement of distress, negatively perceiving social support and expressing hostility within social relationships. All of which are likely to have a detrimental effect in the context of recovery from a traumatic event. Although our analyses examine the issue of underlying theoretical mechanisms, the results showed that in some circumstances avoidant attachment was associated with *lower* levels of PTSD symptoms: in particular that dismissing attachment category had only a small non-significant relationship with PTSD symptoms. This finding provides indirect support for the hypothesis that avoidance of threat-related cues, thoughts and feelings, combined with avoidance of attachment related worries, may be beneficial within the context of recovery from a traumatic event (Fraley, Davis & Shaver, 1998).

Limitations

Despite the rigour with which this meta-analysis was conducted, the results should be interpreted in the context of the following limitations. Firstly, moderator analysis was conducted only on the relationship between insecure attachment and PTSD symptoms. The analysis was structured to provide critical information whilst avoiding repetition. However, this is at the detriment of some finer detail on lower level insecure attachment categories. Furthermore, confirmation of the mechanisms underlying the relationship between attachment and PTSD symptoms could not be established by this meta-analysis for two reasons. First, although emotion-regulation (Benoit et al., 2010), self-worth (Lim, Adams & Lilly, 2012), self-esteem and representations of others (Ortigo et al., 2013), social support (Muller & Lemieux, 2000) and coping strategies (Gore-Felton et al., 2012) have all been found to have mediating or moderating effects on the relationship, there were too few studies investigating these moderators to pool in

the current analysis. Second, causality cannot be determined by pooling data that quantifies *associations* between attachment and PTSD symptoms. Although attachment theory is based on the assumption that attachment style affects the development of PTSD because an individual's attachment style is determined at a young age, and should be relatively stable over time (Bowlby, 1982), the opposite causal hypothesis is theoretically plausible. In other words, the traumatic event, and even the symptoms themselves, may change attachment style (Weinfield, Sroufe & Egeland, 2000; Zhang & Labouvie-Vief, 2004). Indeed, adult attachment styles have been found to be labile in some studies (Baldwin & Fehr, 1995; Davila, Burge & Hammen, 1997; Guðmundsdóttir, Guðmundsdóttir & Elklit, 2006). Until a greater number of longitudinal studies have been published the causal underpinnings of the relationship between attachment style and PTSD remains open.

Another potential limitation was the focus on *adult* attachment, which excludes valuable insights from research investigating the relationship in child populations. The adult inclusion criteria enabled us to provide a more focused analysis, however, by failing to include the child literature we are unable to comment on possible generalisations and similarities/differences between the two populations. This may have considerable theoretical and clinical benefit so should be examined in future.

Finally, the poor reporting of effect sizes in papers included in the analyses led to incomplete data. For example, some papers might report the effect size for anxious attachment and PTSD symptoms but not for avoidant attachment and PTSD symptoms. Unless studies routinely report effect sizes for all attachment categories, any meta-analysis will be based on only a subset of the relevant data.

Implications for Clinical Practice and Research

Results have significant implications for clinical practice and research. Within a clinical context, the finding that fearfully attached individuals are more likely to report PTSD symptoms than other attachment types may be important. Screening for, and addressing, fearful attachment prior to symptom treatment may improve treatment outcomes (Forbes et al., 2010). More widely, results highlight the importance of secure attachment, and therefore provide support for all work – clinical and research – aimed at promoting secure attachment styles.

Future research is needed to explore the issues raised by this meta-analysis in more detail. The medium effect sizes confirm a modest association between attachment style and PTSD symptoms. Although sample characteristics did not moderate these associations we only examined limited characteristics. As outlined in the introduction, many other individual and environmental factors have been shown to influence both PTSD and attachment style and these warrant further consideration. A focus on attachment alongside other aspects of social cognition and social bonds (for example, social support, social acknowledgement and disclosure) would help evaluate social cognitive models of PTSD (Charuvastra & Cloitre, 2008; Sharp et al., 2012), and improve our understanding of the relationship between social cognitive variables and PTSD.

Prospective studies of the moderating and mediating factors affecting the relationship are therefore needed. Likewise, despite some exceptional studies (for example, Elklit et al. 2009; Fraley et al., 2006; Iles et al., 2011; Mikulincer et al., 1999), it seems that both longitudinal *and* intervention studies are also lacking. Given the recent changes to PTSD diagnostic criteria (DSM V, American Psychiatric Association, 2013), it is also necessary to highlight the need for the relationship between adult

attachment and PTSD to be considered using the updated measures that include the new negative cognitions and mood symptom cluster.

Finally, within the attachment literature there is increasing focus on the continuum model of anxious and avoidant attachment, over and above the use of categories. This is an empirically sound development and has been positive in terms of comparability and measure reliability. However, our results suggest there may be benefits to researchers reporting the four attachment categories *as well as* the anxious/avoidant dimensions.

Summary and conclusion

This meta-analysis suggests that adult attachment style has a modest association with PTSD symptoms. This relationship appears to be found across many different types of traumatic event. It does not appear to be affected by the time that has elapsed since the trauma took place, type of event, gender or marital status, and various study characteristics. Secure attachment is associated with lower PTSD symptoms after a traumatic event, whereas insecure attachment is associated with increased symptoms. Results provide support for a renewed focus on the relationship between PTSD symptoms, social bonds, social cognition and attachment (Charuvastra & Cloitre, 2008; Nietlisbach & Maercker, 2009; Sharp et al., 2012). As Fraley et al. (2006) highlight, there are many ways for a person to be insecure, and it may be that examining sub-categories of insecure attachment will provide more insight or explanatory power. Results support previous research that finds anxious attachment (Mikulincer et al., 1993; Scott & Babcock, 2010) and sub-categories of anxious attachment (Muller, Sicoli & Lemieux, 2000) relate to PTSD symptoms over and above categories of avoidant attachment, and may therefore play a greater role in PTSD.

Chapter 3

A social model of posttraumatic stress disorder (PTSD): Interpersonal trauma, attachment, group identification, disclosure, social acknowledgement and negative cognitions

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Abstract

In response to calls for social models of PTSD (Charuvastra & Cloitre, 2008), we hypothesise relationships between interpersonal/non-interpersonal traumatic events, fearful attachment style, emotional disclosure, group identification, social acknowledgment, posttraumatic cognitions and core trauma symptoms. The utility of social support vs social acknowledgement is also briefly considered. To test this exploratory model, a cross-sectional survey of participants ($N = 298$) with varying levels of traumatic symptoms following mixed traumas was conducted. Structural Equation Modelling (SEM) was used to analyse the model. Results support a mediational model, with group identification appearing to mediate the relationship between fearful attachment and social acknowledgement, emotional disclosure appearing to mediate the relationship between interpersonal trauma and social acknowledgment, and posttraumatic cognitions appearing to mediate the relationship

between social acknowledgement and core trauma symptoms. Results suggest that, within this exploratory model, social acknowledgment and social support explain a similar amount of variance in traumatic symptoms, but acknowledgment explains considerably more variance in cognitions than social support. The paper successfully applies current theoretical insights on group identification processes to the posttraumatic environment. This theoretical application is relatively novel within the PTSD literature and helps stimulate new theory in this domain. It also provides further evidence of the ‘social cure’ theory. More broadly, the findings highlight the utility of social psychological constructs in helping explain trauma symptoms. We discuss the implications of our findings, the study limitations and suggest avenues for further research.

Keywords: Posttraumatic Stress Disorder, interpersonal trauma, attachment, social acknowledgment, group identification, disclosure, posttraumatic cognitions

Introduction

Posttraumatic stress disorder (PTSD) is a specific set of prolonged symptoms experienced in response to a very stressful event. Symptoms are grouped into four categories: re-experiencing and intrusions, avoidance/numbing of emotions, increased arousal and negative cognition/mood. Diagnosis of PTSD requires a traumatic event which involves real or threatened death, serious injury or sexual violence to self or others. For a diagnosis to be made, symptoms must persist beyond four weeks. PTSD is by no means the only response to trauma, but is one of the few trauma-specific psychiatric disorders (American Psychological Association [APA], 2013). Given the necessity of the event in the diagnosis of PTSD, research into how different types of trauma may lead to different symptom patterns and/or levels has been useful (Sharp, Fonagy & Allen, 2012). Theorists have highlighted the need for a more in depth examination of the social framework within which a traumatic event occurs, and have emphasised the dynamic, relational, nature of trauma responses (Bonnan-White, Hetzel-Riggin, Diamond-Welch, & Tollini, 2015; Maercker & Horn, 2013). In this paper, we aimed to contribute to the existing PTSD literature by proposing and testing a new social model which delineates the links between type of trauma experienced (*interpersonal* or *non-interpersonal*), various social psychological variables and posttraumatic cognitions/symptoms.

Meta-analyses of risk factors for PTSD have found lack of social support to be one of the strongest predictors of symptom severity (Brewin, Andrews, & Valentine, 2000; Ozer et al., 2003), whilst high levels of social support have been causally implicated in both mental and physical health (Thoits, 2011; Uchino, 2004). It is clear, then that what those around us say and do affects our well-being and resilience to stress. However, leading models of PTSD have tended to focus on information processing,

cognitions and/or memories (Ehlers & Clark, 2000; Foa, Riggs, Dancu & Rothbaum, 1993; Horowitz, 1976). Until relatively recently, social factors tended to be included in posttraumatic models as secondary factors or sequelae (Ehlers & Clark, 2000). New models, which explore social variables, have emerged (e.g., Sharp et al., 2012; Maercker & Horn, 2013) but are relatively unknown and untested compared to the leading models.

The construct *social support* requires further analysis since, despite often being presented as unidimensional, it is comprised of several different social processes. Here we have focused on three processes that may be involved in the social support effect: *emotional disclosure*, *group identification* and *social acknowledgement*. In our hypothesised social model (Figure 1), we begin with the traumatic event (interpersonal vs non-interpersonal) and the individual's typical (dispositional) *attachment style*. Then, the three relational processes are presented as operating between these two antecedent variables and posttraumatic cognitions, to lead to perseverant trauma symptoms.

Interpersonal Trauma

The proposed model (Figure 1) draws together a number of related ideas from existing literature. There is evidence that traumatic responses will be more severe and prolonged following an interpersonal event than a non-interpersonal event (Charuvastra & Cloitre, 2008; Frans, Rimmö, Åberg, & Fredrikson, 2005; Kessler et al., 1994, 2005). By *interpersonal trauma*, we mean a traumatic event perceived to be caused by another human being (e.g., rape/assault). An example of a *non-interpersonal* event would be experiencing a natural disaster like an earthquake. In their meta-analytic study of predictors of PTSD, Ozer, Best, Lipsey and Weiss (2003) found that fearing for one's life appears to be especially associated with interpersonal violence. Charuvastra and

Cloitre (2008) suggested that the “experience of fear associated with a trauma will reflect, in some way, the meaning ascribed to the event” (p. 303). Recent research suggested that, even more than fear, anger and shame responses may be particularly high following an interpersonal event (Badour, Resnick, & Kilpatrick, 2017). The heightened effect and subsequent trauma symptoms experienced in relation to an interpersonal traumatic event may reflect our understanding of human agency, or they may reflect a deeper shattering of social bonds, trust (Janoff-Bullman, 1992) and “post-traumatic change in general beliefs about the world’s orderliness, meaningfulness and benevolence.” (Maercker & Horn, 2013, p. 466). Charuvastra and Cloitre (2008) have called for social models of PTSD in order to examine the interpersonal/non-interpersonal distinction, interpersonal mechanisms and social cognition.

Emotional Disclosure

Emotional disclosure has been well researched, particularly the beneficial psychosocial outcomes from appropriately disclosing stressful/traumatic events (Pennebaker, 1993; Pennebaker, Zech, & Rimé, 2001; Rimé, Kanyangara, Yzerbyt & Paez, 2011). For example, Bedard-Gilligan, Jaeger, Echiverri-Cohen, and Zoellner (2012) investigated individual differences in disclosure, and found sexual and childhood trauma were linked with increased disclosure difficulty, implying that individuals who experience interpersonal traumatic events may be less able or willing to disclose information about the events and their feelings. If an individual has undergone an interpersonal trauma that may have affected their ability to trust another human being, then their willingness to disclose their feelings should be impacted.

Research into the possible theoretical and causal reasons why this may be the case have focused on the fact that disclosing emotions is a relational interpersonal

process. Not only is another human being required, they are required to be open, receptive and, most likely, supportive. In addition to testing the influence of event type (interpersonal or non-interpersonal) on disclosure, Bonnan-White, Hetzel-Riggin, Diamond-Welch and Tollini (2015) considered the influence of the *reaction* of the individual in whom the trauma-survivor chose to confide. They examined 63 college students who reported a history of disclosing at least one traumatic event. Participants provided information about the first person in whom they confided, the social reactions of that person, general social reactions to trauma disclosure, and their own trauma-related cognitions and psychological distress. Women and survivors of non-interpersonal trauma reported more supportive responses than men and survivors of interpersonal trauma. In addition, victim blame (if the first person the survivor told about the event reacted by blaming the survivor) was associated with more negative trauma-related cognitions and trauma-related distress. Interpersonal trauma was also associated with high negative trauma-related cognitions and trauma-related distress.

In a similar student sample study, Littleton (2010) examined female students who had experienced sexual assault. Negative reactions from disclosure partners predicted higher levels of self-blame and negative views of the self after sexual assault, and negative social reactions were associated with increased levels of posttraumatic stress symptoms (PTSS), whereas positive social support seemed to decrease these symptoms. Both studies support the theory that disclosure is a relational interpersonal process. They also highlight the complex relationships between the type of trauma experienced, ability/willingness to disclose and the reactions of those confided in.

Adult Attachment Style

There is evidence that an adults' attachment style may affect the severity and perseverance of PTSD. In a meta-analytic review, Woodhouse, Ayers and Field (2015) found that attachment categories comprised of high levels of anxiety most strongly related to PTSS, with fearful attachment displaying the largest association. In their socio-cognitive model of PTSD, Sharp et al. (2012) used attachment theory to explain the relationship between interpersonal traumatic events, attachment style and PTSS. Attachment theory proposes that our earliest caregiving experiences provide us with internal working models of self and other – schema-like representations of what to expect from relationships that guide relationship behaviours and beliefs. These schemas are broadly categorised as secure or insecure, based on individual levels of relationship anxiety and avoidance. They proposed that attachment schemas impact attachment-relevant social information, and that this relationship is heightened if the individual is confronted with a traumatic loss in the interpersonal realm. The attachment schema is activated and, in the case of insecure attachment schemas, will lead to maladaptive social-cognitive processing (e.g., negative cognitions and social appraisal, attention to negative social stimulus, distorted memory of social events), which in turn will prevent the individual from effectively making use of current attachment relationships or social support.

In support of the mechanisms outlined in Sharp et al.'s (2012) model, evidence exists that an adult's attachment style impacts social cognition and PTSD (e.g., Ortigo, Westen, Defife, & Bradley, 2013). Social psychology offers further evidence of the impact of dispositional attachment schemas onto group processes. Adult attachment styles are conceived as schematic cognitive models of *relationships*. A small number of studies have considered how these working models of relationships may influence how

an individual interacts socially with groups. Specifically, the possible relationship between different attachment styles and the process of group identification has been explored experimentally (Crisp et al, 2009; Milanov, Rubin & Paolini, 2013). Using experimental attachment manipulations, Crisp et al. (2009) found that participants high in attachment anxiety identified less with a salient in-group after imagining a distressing conversation with their romantic partner. In a second experiment, they observed a moderating role for attachment avoidance in the control condition. Milanov, Rubin and Paolini (2013) also explored the relationship between adult attachment and how people interact with social groups. They found that people with a secure attachment style had higher social identification than those with a dismissive-avoidant style and higher communal identification than those with a dismissive-avoidant style or a fearful-avoidant style. Taken together, these experimental studies demonstrate that attachment style does not operate in isolation. Not only do these studies support the idea that attachment style affects how people interact socially, they specifically highlight their impact on the process of social identification.

Group Identification

Group identification comprises people's self-definition in terms of a particular group, together with their evaluation of and emotional attachment to that group (Tajfel, 1978). Jetten, Haslam and Haslam (2012) argued that identifying with a well-functioning group "is an important means by which we can inoculate ourselves against, and repel, threats to our mental and physical health" (p. 4). The process of identifying with a group involves individuals moving from considering themselves as 'I' to considering themselves as 'we'. Jetten et al. (2012) argued that providing that the 'we' individuals adopt is functional, the shift in the self-concept will benefit the individual.

Because groups provide individuals with clear self-definition, a sense of belonging and a raft of norms which guide behaviour, they proposed that well-functioning groups can provide a *social cure* in many health domains.

The health benefits of group identification processes have been observed in, amongst others, recovering stroke patients (Haslam et al., 2008), the elderly (Gleibs, Haslam, Haslam & Jones, 2011) and prison guards (Sani, Magrin, Scrignaro, & McCollum, 2010). Although the benefits of group identification within the context of PTSD have not been extensively considered, there has been some recent research. Mughal, Carrasco, Brown and Ayers (2015) assessed an intervention for war trauma in Sierra Leone and found that the reduction in PTSS in the intervention was greater for participants with a stronger identification with Sierra Leone as a nation. Swartzman, Sani and Munro (2017) compared the utility of social support, family identification (sense of belonging to and commonality with family members) and family constraints (the extent to which family members are closed, judgmental or unreceptive) in predicting posttraumatic stress after cancer. Both family identification and family constraints were more strongly associated with posttraumatic stress than social support, with identification relating to lower symptoms, and constraints relating to higher symptoms. Finally, Kearns, Muldoon, Msetfi, and Surgenor (2017) measured participants before and after a charity fundraiser for suicide prevention. Those who had lost someone they knew and/or a family member to suicide were found to have a significant increase in well-being after the event, and this was mediated by identification with the crowd. Although Kearns et al. (2017) did not specifically measure trauma symptoms, their findings support the idea that social identification may be protective in a posttraumatic context.

The above three studies consider three different types of social identification: national (also see Muldoon & Downes, 2007), family and trauma-survivor identification. They all point to the benefits of identification with salient groups in the aftermath of a trauma, and they strengthen the rationale for continued research in this area.

The social identity model of stress suggests that social identity can play a role in protecting group members from adverse reactions to stress because it provides a basis for group members to receive and benefit from social support. Haslam, O'Brien, Jetten, Vormedal and Penna (2005) studied three groups exposed to high levels of stress: patients recovering from heart surgery, bomb disposal officers and bar staff. There was a positive correlation between social identification and social support, and a negative correlation between social identification and stress. Path analysis indicated that social support was a significant mediator of the relationship between social identification and stress. Branscombe and colleagues (e.g., Branscombe, Schmitt, & Harvey, 1999) have demonstrated that when low-status groups are exposed to stress (prejudice and discrimination), the sense that – as victims of injustice – they share identity with other members of those in-groups buffers their well-being. As Haslam et al. (2005) explained, “such research suggests that...the experience of beneficial social support – is more likely to occur to the extent that individuals are socially identified with those in a position to provide support” (p. 357). In the current study, we aimed to explore the relationship between group identification and perceived social support, but do so using a relational trauma-specific measure of social support: social acknowledgment.

Social Acknowledgement

Social acknowledgement is a trauma-specific construct that builds on and extends traditional measures of social support (Maercker & Horn, 2013; Maercker & Müller, 2004). Whereas social support measures aim to determine how supported an individual feels generally, social acknowledgement measures aim to determine how understood the individual feels specifically as the victim of a traumatic event. Do victims feel that people understand what they have been through? Do they feel there is enough sympathy for them as the victim of a specific trauma? Do they feel that their experience is underestimated? In short, is their traumatic experience acknowledged? Maercker and colleagues proposed that people react to the individual as a victim of a certain *type* of trauma – that the event itself is relevant to social reactions. Social acknowledgement of a rape, for example, will probably be different from acknowledgement of a car accident.

Social acknowledgement theorists are interested in how the individual perceives *disapproval* and *recognition*. Compared to conventional measures of social support, the acknowledgement measure is found to explain a higher proportion of PTSS variance (Maercker & Müller, 2004). Low levels of social acknowledgement (high disapproval/low recognition) is implicated in higher levels of PTSD in violence exposure (Sommer et al., 2017), aid workers (Jones, Müller, & Maercker, 2006) and crime victims (Müller, Moergeli, & Maercker, 2008).

Posttraumatic Cognitions

Although we focus on social factors, we also recognise the importance of cognitive factors, particularly their role in the perseverance of symptoms after the event (Ehlers & Clark, 2000). Theorists have suggested that high levels of social support may

impact PTSD by influencing posttraumatic cognitions (Ehlers & Clark, 2000; Guay, Billette, & Marchand, 2006) and empirical evidence supports this prediction (Woodward et al., 2015; Robinaugh et al., 2011). The widely used posttraumatic cognitions inventory (PTCI, Foa, Tolin, Ehlers, Clark, & Orsillo, 1999) consists of three subscales: negative cognitions about self (e.g., “*I have no future; I am a weak person*”), negative cognitions about the world (e.g., “*people can’t be trusted*”; “*the world is a dangerous place*”), and self-blame (e.g., “*the event happened because of the way I acted*”). By considering these items, and therefore the nature of posttraumatic cognitions, the social referencing implicit in this type of cognition is apparent. The measure places the individual in the wider social context and measures a type of social cognition (blame).

The fourth PTSD symptom cluster - negative cognitions and mood - was added to the Diagnostic and Statistical Manual relatively recently (DSM V, APA, 2013). Clinical PTSD measures have been updated to reflect the new symptom cluster, and items show the same social referencing we see in the PTCI. For example: “In the past month how much were you bothered by having strong negative beliefs about yourself, other people, or the world (*for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous*)?”; “In the past month how much were you bothered by blaming yourself or someone else for the stressful experience or what happened after it?” (Weathers, Litz, Keane, Palmieri, Marx, & Schnurr, 2013). Given this diagnostic acknowledgement of the social nature of appraisals, we could anticipate that social factors and interpersonal mechanisms may well be increasingly important in predicting PTSD.

This paper draws on the above theories to develop and test a social model of trauma symptoms, shown in Figure 1, that builds upon and extends existing models

(e.g., Maercker & Horn, 2013; Sharp et al., 2012). The full model is exploratory: this combination of variables has not been tested in its entirety before. The mechanisms and pathways in the model are explained below.

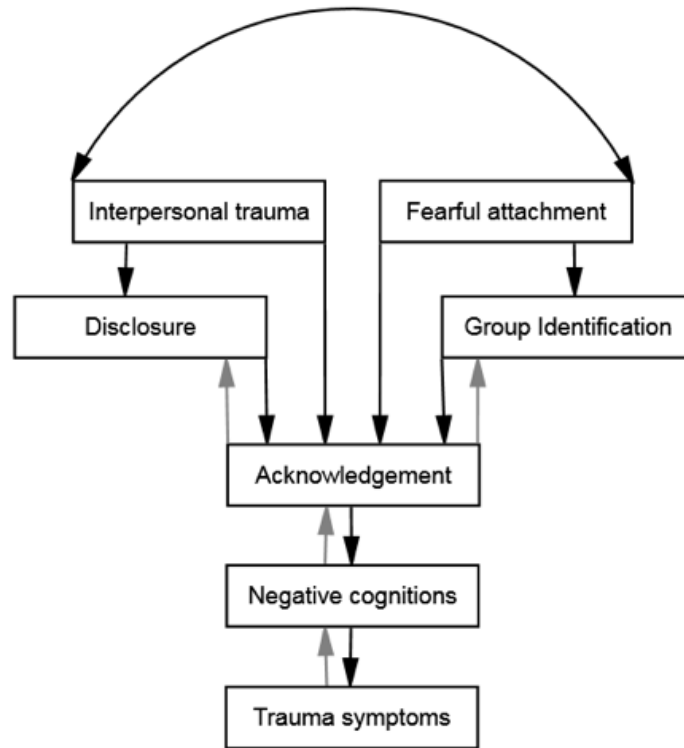


Figure 1 The proposed social model of Posttraumatic Stress Disorder (PTSD)

The Proposed Social Model

Overview. The model presented in Figure 1 is not an attempt to radically overhaul the way that we conceive of PTSD. Instead, it aims to draw together different, well verified aspects of other models and research, whilst also aiming to broaden the field's perception of relational interpersonal processes by including group processes (i.e., identification). We aimed to describe the social and interpersonal processes that lead to elevated trauma symptoms, and in doing so also describe the process of

perseverant PTSS through the inclusion of feedback loops. The model's structure and variable order reflects past theory and research, as outlined above (e.g., the causal relationship between interpersonal traumas and reduced emotional disclosure). The model we present includes social acknowledgment, but we also test a variant of the model that uses a more traditional trauma-specific measure of social support to allow us to compare the construct's utility.

Interpersonal trauma and attachment style. Although an individual's attachment style is conceived as a relatively fixed dispositional construct that develops in infancy, theoretically we would still have expected the traumatic event to relate to attachment behaviours and feelings, as attachment patterns are triggered at times of stress (Bowlby, 1982; Weinfield, Sroufe & Egeland, 2000). Due to the dispositional nature of attachment, rather than inferring directional causation, we proposed that the constructs inter-relate.

Interpersonal trauma and social acknowledgement. We proposed that the *direct* effect of interpersonal trauma on social acknowledgement is mainly explained through the judgements that society makes of the type of trauma experienced. The social acknowledgement literature has suggested that the individual's social network, and society at large, will have their own response to the type of trauma experienced, which will be perceived by the traumatised individual in terms of higher or lower social acknowledgement. We anticipated that a large part of the *indirect* effect of interpersonal trauma on social acknowledgement would be mediated via the process of emotional disclosure (Maercker & Horn, 2013). An individual who has experienced an interpersonal trauma may be less willing, or able, to discuss the event that occurred. We hypothesised that lower levels of emotional disclosure may lead to lower levels of perceived social acknowledgement. This is illustrated in the extreme example of an

individual who has experienced a traumatic event but talks to no one about the event or their feelings. In this extreme case, the individual's perception of social acknowledgement will necessarily be extremely low as all avenues for sympathy and acknowledgement are closed.

Attachment style and social acknowledgement. We anticipated that an individual's attachment style, triggered by the event, will *directly* affect their perception of social acknowledgement. As explained above, due to its negative impact on interpersonal relationships, we anticipated that higher levels of insecure attachment, in particular fearful attachment, would directly relate to lower levels of perceived social acknowledgement. In a novel contribution, we also proposed that high levels of attachment anxiety/avoidance (fearful attachment) would *indirectly* relate to social acknowledgement, via group identification. A relatively homogenous sample, in terms of either demographics, trauma type or other social indicators, could be asked about their strength of identification with a specific, common, group (for example, a student sample may be asked about their identification with the group of students in their halls of residence). However, as the sample was relatively heterogeneous, participants were asked to nominate a group that was important to them. We anticipated that identification with this nominated group would provide the basis for accepting/perceiving social acknowledgment. As the social acknowledgement construct builds on the theoretical social support framework (Maercker & Horn, 2013), we expected to observe a similar relationship between identification and acknowledgement, as has been observed between group identification and perceived social support (Haslam et al., 2005).

Social acknowledgement and posttraumatic cognitions. As proposed in the literature and evidenced in social acknowledgment research, we expected low levels of

social acknowledgement to relate to higher levels of posttraumatic cognitions, and that this would relate to higher levels of core trauma symptoms. At a cognitive level, social acknowledgement is likely to operate similarly to social support which, studies have suggested, impacts PTSD via post traumatic cognitions (Woodward et al., 2015; Robinaugh et al., 2011). High levels of social acknowledgment may facilitate the recovery process by working to help affirm cognitions that have been shaken during the trauma, showing the individual that they are cared for and protected by their close relationships and groups. The reverse is true of low/negative levels of social acknowledgement since we would anticipate that these would heighten feelings of fear and mistrust, and that this would lead to a cycle of negative cognitions about self and others. Further, given that perceived social acknowledgement is a construct made up of negative cognitions about family and wider society, we expected that the *primary* means in which it would impact other trauma symptoms was via posttraumatic cognitions.

Posttraumatic cognitions and symptoms. Available research has suggested a strong relationship between posttraumatic cognitions and posttraumatic stress disorder (PTSD; Ehlers, Ehring, & Kleim, 2012; Dunmore, Clark, & Ehlers, 1997; Ehring, Ehlers, & Glucksman, 2006; Foa et al. 1999). It is this evidence that helped support the inclusion of negative cognition in the DSM V diagnosis. At the time of data collection, no new and reliably tested measures of PTSD had been published to reflect the updated DSM V. Given the evidence, we have positioned cognitions as a trauma-relevant process leading from acknowledgement to other core trauma symptoms.

Reciprocal loops. The model includes reverse mechanisms indicating how the relationships can feasibly be conceived as operating in the opposite direction. Ehlers and Clark (2000) have described how the appraisal of trauma symptoms themselves

exacerbate and prolong symptoms. As symptoms worsen, so too will negative cognitions, so at the base of the model we have added a feedback arrow from symptoms to cognitions. Further into the model, we anticipated that an increase in negative cognitions would negatively impact both perception of social acknowledgement and acknowledgement itself as individuals withdraw and avoid others. As perception of social acknowledgement decreases, we expected that willingness to disclose feelings and the strength of positive group identification with those around them would also decrease. The model we present is not static: it is the dynamic *process* of perseverant and recurring symptoms.

In summary, this study aimed to test the ability of a new social model, which consists of the above social and cognitive variables, to explain variance in core PTSD symptoms. We hypothesized that inter-personal trauma would directly predict social acknowledgement, and that the effects of trauma would be partially mediated through emotional disclosure. Similarly, we hypothesised that fearful attachment would directly predict levels of social acknowledgement, and that its effects would be partially mediated through group identification. We expected levels of social acknowledgement to directly predict posttraumatic cognitions, which in turn would predict core trauma symptoms.

Method

Design

We conducted a cross-sectional online survey of participants with varying levels of traumatic symptoms following mixed traumas. Interpersonal trauma (binary), fearful attachment, emotional disclosure, group identification, perceived social acknowledgement, posttraumatic cognitions and core trauma symptoms were measured using self-report measures at one time point.

Participants

A convenience sample of participants ($N = 298$) was recruited via the Internet. The sample was predominantly Caucasian ($N = 258$) and female ($N = 231$), with a mean age of 37. To be eligible for the study, participants had to be over 18 years old, be fluent in English and have experienced at least one traumatic event. The largest category of traumatic event nominated as the one which bothered them the most is 'other' ($N = 50$) which predominantly consisted of incidents of types of psychological abuse/bullying ($N = 15$) or the death of someone known ($N = 17$). The remaining reported events varied greatly in nature (i.e., seeing sister self-harm, finding out about a partner's infidelity, being falsely arrested). The death of significant other category was the largest single event category ($N = 44$), followed by sexual assault by someone known ($N = 37$) and serious accident ($N = 31$). When asked to nominate the social group they most identified with, the majority of participants nominated a group of close family ($N = 86$), followed by a group of friends ($N = 76$), and work colleagues ($N = 25$). Seventy eight percent of participants ($N = 231$) disclosed that they have been diagnosed with a psychological disorder, of which the majority had been diagnosed with PTSD or Complex-PTSD ($N = 107$).

Measures^{iv}

Group identification. Participants read a short paragraph which explained that: by ‘groups’ we mean collections of people that are important to you and with whom you interact regularly. You do not necessarily have to meet them face-to-face, the communication may be online or over the phone. This may be a group you feel generally positive towards, or it may be a group you find challenging.

We then provided numerous examples of groups (e.g., a sports team, a household, a family, a friendship circle), and asked participants to tell us the name of the group they most identify with. The extent to which participants identified with their nominated group was then measured using three solidarity items, three centrality items and one satisfaction item from Cameron (2004), along with two satisfaction items from Leach et al. (2008). Example items: ‘I have a lot in common with other members of this group’ (Cameron, 2004), ‘I am glad to belong to this group’ (Leach et al., 2008) and ‘the fact that I am a member of this group rarely enters my mind’ (Cameron, 2004). Response scale ranged from 1 (strongly disagree) to 7 (strongly agree), and high scores represent high levels of identification with the named group. ($\alpha = .83$).

Social acknowledgement. Six items were taken from Maerker and Muller’s (2004) social acknowledgement Scale. The original measure had 16 items. However, to prevent item overload, six were chosen based on their performance in Maerker & Muller’s (2004) original factor analysis and their factor loadings. Two were taken from the social recognition subscale, two from the family disapproval subscale and two from the general disapproval subscale. Example items: “Most people cannot imagine how difficult it is simply to continue with ‘normal’ daily life,” “My family showed a lot of understanding for my state after the incident,” “The reactions of my acquaintances were

helpful.” Response scale ranged from 0 (*totally disagree*) to 5 (*totally agree*), and high scores represent high levels of perceived social acknowledgement ($\alpha = .75$).

Adult attachment. Bartholomew and Horowitz’s (1991) 5-item measure was chosen to measure attachment. It presents short descriptions of the four different attachment styles (secure, fearful, preoccupied and avoidant) and asked participants to rate how much the description describes their general relationship style on a 7-point Likert scale. Likewise, participants were asked to choose one description which best describes them. Example description of fearful attachment style: “I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.” Response scales ranged from 0 (*strongly disagree*) to 7 (*strongly agree*), and high scores represent high levels of the measured attachment style. Scale reliability could not be calculated for this measure as items are used individually and measuring incompatible constructs.

Emotional disclosure. Four items were taken from Bedard-Gilligan et al.’s (2012) measure of emotional disclosure. Example items: “How many times have you told the full story (including your surroundings, feelings, thoughts, and the involvement of yourself/others) of what happened during the event?,” “When you talk about this event, how much detail do you include?” Response scale ranged from 0 (*never*) to 5 (*very often*), and high scores reflect high levels of emotional disclosure ($\alpha = .72$).

Social support. The 14 items from Joseph et al.’s (1992) Crisis Support Scale were used to assess overall social support. Example items: “Were people sympathetic and supportive just after the event?” “Are people sympathetic and supportive at the present time?” “were people helpful in a practical sort of way just after the event?”, “Are people helpful in a practical sort of way at the present time?”, “Whenever you

wanted to talk, how often was there someone willing to listen just after the event?”, “Whenever you want to talk how often is there someone willing to listen at the present time?” (1 - *never* to 7 - *always*, high scores representing high levels of overall support; $\alpha = .80$).

Posttraumatic cognitions. The 12 top loading items from the original 33 item Posttraumatic Cognitions Inventory (PTCI, Foa et al., 1999) were used. Seven items were from the Negative Cognitions about Self factor, three from Negative Cognitions about Others, and two from Self-blame. Example items: “People can’t be trusted”, “My life has been destroyed by the trauma”, “The event happened because of the way I acted”. Response scale ranged from 1 (*totally disagree*) to 7 (*totally agree*), and high scores represent high levels of posttraumatic cognitions ($\alpha = .89$).

Posttraumatic Stress Symptoms (intrusions, avoidance and hyperarousal). Horowitz et al.’s (1979) 15-item Impact of Events Scale (IES) was used to measure core trauma symptoms. Example items: “My feelings about it [the event] were kind of numb”, “I tried not to talk about it [the event]”, “I thought about it [the event] when I didn’t mean to”, “I had strong waves of feelings about it [the event]”. Response scale ranged from 0 (*not at all*) to 5 (*often*), and high scores represent high levels of core trauma symptoms. ($\alpha = .91$).

Traumatic events and interpersonal trauma. The traumatic events list was taken from the validated and widely used PTSD Diagnostic Scale (PDS; Foa, Cashman, Jaycox & Perry, 1997). The list includes many events included in the Diagnostic and Statistical Manual (APA, 2013). Events include: serious accident, fire or explosion, natural disaster, traumatic childbirth, military combat or experience of war, sexual assault by someone you know. Also included is ‘other’, which includes a free-text box. Participants were asked to mark all the events they have experienced and then state the

one event which bothers them the most. For the analysis, events were grouped into interpersonal and non-interpersonal, and participants each received a binary (yes/no) score.^v

Procedure

Participants were recruited via social media platforms such as Twitter, online forums and trauma support websites. A brief advertisement was posted on these platforms asking if people had experienced a traumatic event and, if so, if they would consider taking the “Social worlds and trauma survey.” Upon clicking on the link in the advert, potential participants were directed to a webpage hosted by Qualtrics which gave a detailed explanation of the study. Participants then had to provide their consent to participate by answering “yes” or “no” to two questions. Firstly, they were presented with explicit details of the inclusion criteria, and asked if they met them. Secondly, they consented to take part based on the information that they had read on the study information page. After providing consent, participants were able to complete the survey. The research project satisfied British Psychological Society (BPS) ethical guidelines and was approved by the University of Sussex Sciences & Technology Cross-School Research Ethics Committee.

Analysis

Bivariate correlations were conducted using SPSS 23. The full model was tested using structural equation modelling, using the AMOS software.^{vi} Model fit was evaluated using the following indices: chi-square, which assumes the perfect fit of the model, so a significant difference indicates a poor model; root mean square error of approximation (RMSEA), for which values under 0.10 are acceptable, <0.08 is better,

and <0.05 is good; comparative fit index (CFI), for which values >0.9 are acceptable; and Tucker-Lewis coefficient (TLI), for which values close to 1 indicate a good fit (Shumacker & Lomax, 2004).

There were two types of missing data. The first type comprised of participants who randomly missed one or two items from one of the measures. For these participants their mean score for the measure was calculated from the valid data points they provided. The second type of missing data was more severe and reflects participants who missed 40% or more of the items from a single measure. These cases were excluded from any analyses using the measure. In the most severe case, 20 participants missed more than 40% of group identification items, meaning that the N for the final SEM analyses is 278.

Additionally, missing value analysis was performed on all variable total and mean scores. All variables were used as grouping variables (completers vs non-completers) and there were no significant differences in the mean PTSS scores. We repeated the analysis using various outcome measures and the only significant completers vs non-completers difference related to social support and group identification. Participants who did not wish to name a group and complete the group identity measure had previously scored lower on social support, implying that the group identification missing data was not random.

Results

Overview

Our three mediation hypotheses – that disclosure mediates the relationship between interpersonal trauma and social acknowledgement, group identification mediates the relationship between adult attachment and social acknowledgement, and posttraumatic cognitions mediates the relationship between social acknowledgement – were first explored through bivariate correlations. All correlations can be viewed in Table 1. Our primary aim was to test the ability of the entire model to explain variance in PTSS. Structural Equation Modeling (SEM) was used to test this overarching hypothesis. As the full model is exploratory, other theoretically sound mediation models (i.e., the relationship between disclosure and core trauma symptoms may be mediated by group identification) were tested using SPSS and SEM. The utility of the social support model (Figure 3) was also tested using SEM. Reciprocal feedback-loops were tested as mediation models using SPSS.

Sample Characteristics

A large number of participants (62%) had experienced interpersonal trauma ($N = 185$). The mean time elapsed since the trauma occurred was 7.5 years ($SD = 4$ yrs). Trauma symptoms within the sample were elevated ($M = 2.73$, $SD = 1.21$) compared to normal levels experienced after stress ($M = 0.65$, $SD = 0.52$; Horowitz, Wilner & Alvarez, 1979). Posttraumatic cognitions were also high ($M = 3.98$, $SD = 1.32$) compared to normal levels experienced after trauma/stress ($M = 1.06$, $SD = 0.51$; Foa, Tolin, Ehlers, Clark, & Orsillo, 1999). Attachment scores ranged from 1 – 7 on all four attachment style items (Sec. $M = 2.82$, $SD = 1.86$; Fear. $M = 4.93$, $SD = 1.93$; Preocc. $M = 3.26$, $SD = 1.94$; Dismiss. $M = 4.09$, $SD = 1.97$). Fearful attachment was particularly

elevated, as has been found in multiple studies of traumatised samples (Woodhouse, Ayers, & Field, 2015). Emotional disclosure scores were midway ($M = 2.44$, $SD = .73$) within the scale's range (0 - 5). For those who completed the questionnaire ($N = 278$), strength of identification with their nominated group was relatively high ($M = 5.10$, $SD = 1.10$) within the scale's range (0 – 7.00).

Bivariate Correlations

As can be seen from Table 1, consistent with our hypotheses, there was a correlation between interpersonal trauma and disclosure, and between disclosure and social acknowledgement. Interpersonal trauma and social acknowledgement were also negatively related. Further, as we hypothesised, there were correlations between secure attachment and group identification and between fearful attachment and group identification. Group identification related to social acknowledgement. Additionally, both secure attachment and fearful attachment were associated with social acknowledgement. In support of our hypotheses, there was a robust negative correlation between social acknowledgement and posttraumatic cognitions, and posttraumatic cognitions also correlated with core trauma symptoms.

Table 1 Cross-sectional correlations between trauma symptoms, cognitions, acknowledgement, group ident, disclosure, attachment, interpersonal trauma, gender, time since trauma and age. Gender (Male = 1, Female = 2); Interp. trauma (No = 0, 1 = yes); *p < .05, **p < .01; Mean scores are presented and used in analysis

Variables	1	2	3	4	5	6	7	8	9	10	11.	12.	13.
1. IES	-	.54**	-.35**	.03	-.33**	-.22**	.24**	.07	.11	.09	.14*	.02	-.02
2. PTCI		-	-.64**	-.24**	-.34**	-.46**	.46**	.23**	.00	.24**	.14*	.07	.16**
3. Acknowledge.			-	.23**	.37**	.46**	-.41**	-.10	.03	-.35**	-.22**	-.14*	-.41**
4. Group Id.				-	.01	.13*	-.12*	-.04	-.04	.00	.05	-.11	-.10
5. Disclosure					-	.31**	-.26**	-.04	-.11	-.23**	-.16**	.10	-.14*
6. Secure						-	-.56**	-.06	-.07	-.17**	-.07	-.07	-.26**
7. Fearful							-	.19**	.13**	-.23**	.19*	.03	.15*
8. Preoccupied								-	-.17**	.05	.09	-.08	-.04
9. Dismissing									-	-.05	-.08	.14*	-.03
10. Interp. t										-	-.19**	-.01	.20**
11. Gender											-	-.02	-.07
12. Age (yrs)												-	.33**
13. Time since t. (yrs)													-
Mean	2.73	3.98	2.08	5.10	2.44	2.82	4.93	3.26	4.09	.62	1.78	42	7.5
Std. deviation	1.21	1.32	1.13	1.10	.73	1.86	1.93	1.94	1.97	.49	.42	12.5	4
Range (min)	.00	1.08	.00	1.67	.00	1	1	1	1	0	1	23	0.5
Range (max)	5.00	6.67	4.83	7.00	4.83	7	7	7	7	1	2	73	10+
N	298	298	296	278	292	298	296	297	294	298	298	298	295

Testing the Whole Social Model

The model was tested by starting with the hypothesised model (Figure 1). Additional covariance paths were then added based on both theory and the modification indices to enable a better model fit. The final model (Figure 2) included the hypothesised indirect covariance between interpersonal trauma and fearful attachment (.16), and five additional indirect covariance paths from and between residual errors. Of note, the covariance between fearful attachment and negative cognitions residual error (e4) was particularly strong (.29). The full model accounted for 31% of core PTSS variance and all fit indices for the final model were excellent (shown in Figure 2). Our principle aim of predicting variance in PTSS by using a social mediation model was therefore achieved. Please see Table 2 for the indirect, mediated effects of variables within the final model (Figure 2).

As hypothesised, the standardised effect of interpersonal trauma onto disclosure was $-.21$ ($p < .001$), with interpersonal trauma explaining 4% of variance in emotional disclosure scores. The standardised effect of disclosure onto social acknowledgement was $.23$ ($p < .001$), and interpersonal trauma onto social acknowledgment was $-.26$ ($p < .001$). As such, these results support our mediation hypothesis that interpersonal trauma would directly (and negatively) relate to acknowledgement, and indirectly via disclosure.

As hypothesised, the effect of fearful attachment style on group identification was $-.14$ ($p < .05$), with fearful attachment explaining 2% of variance in group identification scores. The effect of group identification onto social acknowledgement was $.20$ ($p < .001$), and of fearful attachment onto social acknowledgment was $-.27$ ($p < .001$). These results support our mediation hypothesis that fearful attachment would directly relate to acknowledgement, and indirectly relate via group identification. The direct paths and

indirect paths from interpersonal trauma (via disclosure) and fearful attachment (via group identification) accounted for 33% of variance in social acknowledgement.

As hypothesised, the effect of social acknowledgement onto negative cognitions was strong, $-.55$ ($p < .001$), as was that of negative cognitions onto core trauma symptoms, $.56$ ($p < .001$). The direct paths and indirect paths from interpersonal trauma (via disclosure) and fearful attachment (via group identification), and the direct path from social acknowledgement, accounted for 41% of variance in negative cognitions.

As we expected, other theoretically sound mediation models existed between the variables within this cross-sectional sample. As examples: the relationship between interpersonal trauma and disclosure was mediated by social acknowledgment; the relationship between attachment and group identification was mediated by social acknowledgement. Other models we might expect to find did not exist (i.e., the relationship between disclosure and core trauma symptoms was not mediated by group identification). Although many mediation models existed, critically, the only theoretically cogent variable structure – using all variables – that returned excellent model fit indices was the proposed model.

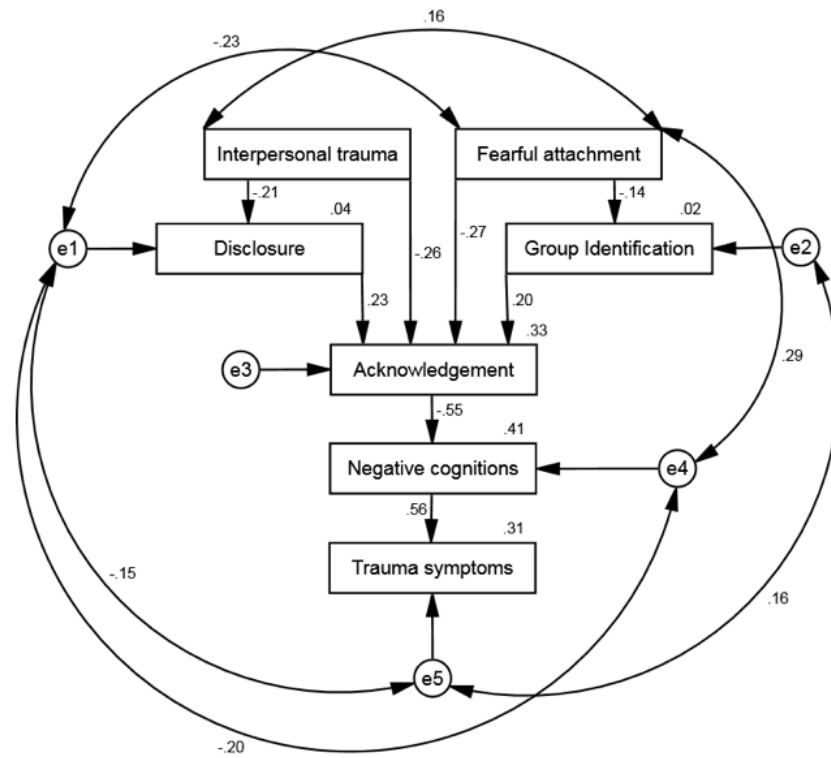


Figure 2 Structural Equation Modelling (SEM) of the proposed social model of Posttraumatic Stress Disorder (PTSD). Standardised coefficients are reported ($N = 278$), $\chi^2 = 8.24$, $df = 7$, $p = .31$; RMSEA = .025, 90% CI: .00 - .08; CFI = .997; TLI = .991

Social Support vs Social Acknowledgement

An alternative model was tested using social support in place of social acknowledgment (Figure 3). The pathway coefficients and *p*-values were similar. However, the standardised coefficient from disclosure to social support (.44) was notably higher than from disclosure to acknowledgment (.23). Interpersonal trauma, attachment, disclosure and group identification explained similar amounts of variance in social support (31%) and social acknowledgment (33%). Both models explained identical amounts of variance in core trauma symptoms. The most prominent difference between the two models was the explained variance in posttraumatic cognitions. Where the acknowledgement model explained 41% of variance, the social support model explained 20%. To enable model fit data to be calculated, the direct path from fearful attachment to social support had to be removed.

The indirect mediated effects, and their associated significance values, within the social support model were similar to those reported in Table 2 for the social acknowledgment model. However, of note, the indirect effect of fearful attachment onto cognitions was nonsignificant within the social support model.

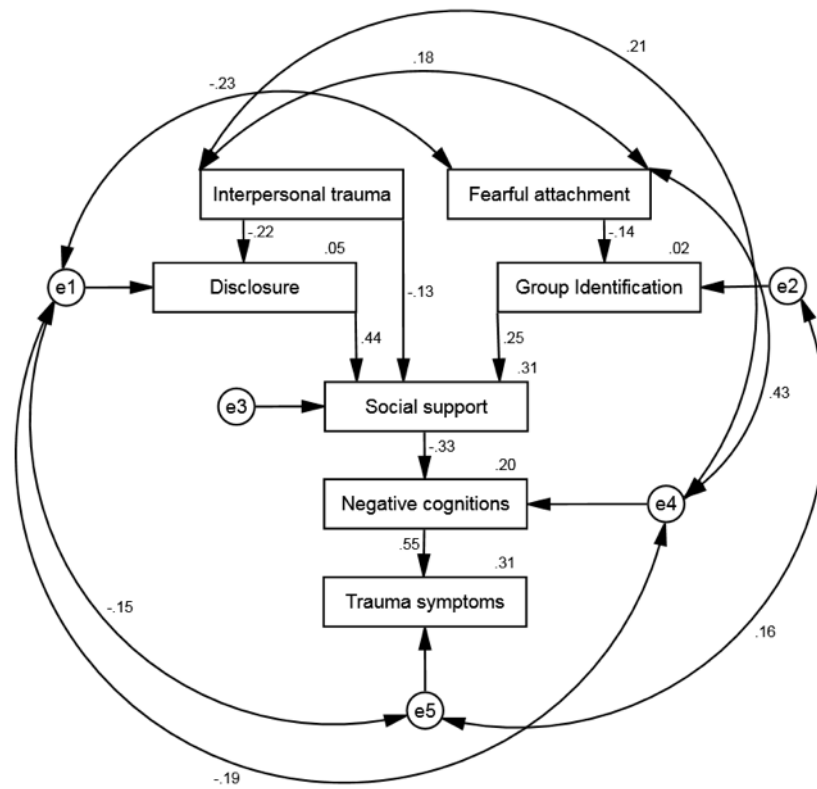


Figure 3 Structural Equation Modelling (SEM) of a model variant using social support. Standardised coefficients are reported ($N = 278$), $\chi^2 = 8.15$, $df = 7$, $p = .32$; RMSEA = .024, 90% CI: .00 - .80; CFI = .997; TLI = .991

Table 2

The indirect, mediated effect of each column variable on each row variable, for the final model

	Interp.	Fearful	Disclosure	Group Id.	Acknow.
Acknow.	-.11**	-.02*			
Cognitions	.44*	.11*	-.23*	-.13**	
PTSS	.23**	.06**	-.12**	-.07**	-.34**

* $p < .05$ ** $p < .01$

Reciprocal Feedback Loops

The feedback loops presented in Figure 1 were tested as mediations. Core trauma symptoms significantly predicted acknowledgement via negative cognitions. Negative cognitions significantly predicted disclosure via acknowledgment. Negative cognitions did not significantly predict group identification via acknowledgment, however acknowledgement did significantly predict group identification in a regression analysis.

Discussion

The proposed social model of PTSD explained almost a third of the variance in core trauma symptoms, as measured by the IES scale. This result is all the more notable given the very heterogeneous sample of trauma victims that were surveyed. In general, all our hypotheses were supported by our results. Experience of an interpersonal traumatic event, a fearful attachment style, low emotional disclosure, low levels of group identification, low perceived social acknowledgement and high posttraumatic cognitions, were all associated with higher levels of intrusion, avoidance and hyperarousal trauma symptoms. The effect of interpersonal trauma on social acknowledgement seems to be partially mediated by emotional disclosure; the effect of attachment style on social acknowledgment may be partially mediated by group identification; and the effect of social acknowledgement onto core trauma symptoms appears to be mediated via posttraumatic cognitions. Although an alternative model replacing social acknowledgement with social support yielded similar standardised coefficients and fit indices, the social support model fit could only be achieved by removing a nonsignificant direct path from fearful attachment to social support. More importantly, the social support model explained 20% of cognitions compared to the 41% explained by acknowledgement. Given the theoretical and clinical significance of posttraumatic cognitions in the development of PTSD, we concluded that social acknowledgment may have greater explanatory power within a posttraumatic context than social support.

These findings underline the importance of developing and testing social models of PTSD (Charuvastra & Cloitre, 2008) and support elements of previously proposed models (Sharp et al., 2012; Maercker & Horn, 2013). Consistent with Sharp et al. (2012), our results support the use of attachment theory as a means of understanding the

processes operating between an adult's attachment style, social cognition and posttraumatic cognitions/symptoms. Our results also support elements of Maercker and Horn's (2013) model, especially their assertion that interpersonal traumatic events relate to high levels of PTSD via the individual process of emotional disclosure and the social process of social acknowledgement.

Certain aspects of the model require further consideration, such as the relationship between social acknowledgement, posttraumatic cognitions and PTSS. The substantial negative association between social acknowledgement and posttraumatic cognitions implies that negative cognitions may mediate a considerable amount of the effect of social acknowledgement on trauma symptoms. This finding, and the results more generally, support the notion that posttraumatic cognitions may play an important role in the perseverance of trauma symptoms. Despite the fact that negative cognitions and mood has been added to PTSD diagnostic criteria, our results suggest that considering their role separately from other core trauma symptoms may be beneficial if we want to better understand how social factors impact symptoms. Relatedly, social support appears less proficient at explaining variance in posttraumatic cognitions than the social acknowledgment construct.

As advocated within the PTSD literature (Charuvastra & Cloitre, 2008), our findings support a more nuanced consideration of which processes may be at work when social factors are implicated in recovery from a traumatic event (Brewin et al., 2000; Ozer et al., 2003). Our results also support Maercker and Horn's (2013) dynamic multi-levelled approach to understanding trauma response. The event is represented by the interpersonal/non-interpersonal distinction, but remains present throughout the model through its impact on both emotional disclosure and social acknowledgement. At the individual level, disposition/personality is represented through attachment style,

affective processing through emotional disclosure, and cognitive processing through posttraumatic cognitions. At the group level, we included the process of group identification and the family disapproval subscale of the social acknowledgement measure. The broader social context is represented via the general disapproval and social recognition subscales of the social acknowledgement measure.

Strengths and Limitations

The study's core strength is that it draws together social factors that may be important in the aetiology of PTSD. The mechanisms linking these social factors to each other, and PTSS, are theoretically sound. The model is firmly based on previous research and theory, but also incorporates novel elements. The inclusion of group identification, largely absent from the PTSD literature, is particularly noteworthy. However, a number of limitations also stand out.

The study has a cross-sectional design and we find evidence of reciprocal feedback-loops, so any inferences about causality are problematic. The obvious remedy to this defect would be to use a longitudinal design, yet such a design is not without its difficulties. Our participants mainly had a time since trauma of over five years, by which time symptoms are likely to have become relatively stable and therefore challenging to study via a longitudinal design (which requires some measurable change). Given the probable high individual stabilities in trauma symptoms, any such longitudinal design would require a very large sample to have a statistical chance of detecting such change and its determinants. Furthermore, the interval between testing points would probably need to be quite long, which increases the risk of participant attrition. Perhaps one solution would be to combine a longitudinal design with the

evaluation of some intervention which, it is to be hoped, would induce some positive change in participants.

Relatedly, because the data is cross-sectional we cannot include the proposed feedback loops in the SEM model. Although we test them individually using mediation and regression, more complex multivariate models which include the feedback-loops need testing. This could be achieved in the future through a longitudinal cross-lagged design.

Full measures were not used in some cases (emotional disclosure, social acknowledgement and negative cognitions). Due to the nature of recruitment – online via social media – we removed items to reduce the likelihood of drop-outs, and therefore maximise the possible sample size. This was achieved, but perhaps to the detriment of the scope of some measures. In particular, given the pivotal role of social acknowledgement within the model, using the full scale would have enabled us to investigate the role of the three subscales. Related to this, the variables we use in the model are closely related concepts (e.g., social acknowledgement and group identification), which therefore raises the issues of shared variance. Although this issue is unavoidable, testing the measure in other samples and/or using different measures would help address the issue.

The predominantly female sample raises issue of generalisability despite the fact gender was not found to be a significant covariate. A more gender-balanced sample is required to test the model again, and allow us to ascertain if it is truly generalisable to the whole adult population.

Lastly, the traumatic events list included within the study measures is widely used (PDS, Foa, Cashman, Jaycox and Perry, 1997), however, it does not correspond with the DSM V event list update (APA, 2013). Although the clinical definition of what

constitutes a traumatic event is often viewed as subjective, unnecessary and in need of constant review (e.g., Brewin, Lanius, Novac, Schnyder, & Galea, 2009; Kilpatrick, Resnick, & Acierno, 2009; Pai, Suris & North, 2017), to ascertain the model's clinical relevance DSM event lists should be used along with clinical PTSD diagnostic interviews.

Future Research and Clinical Implementation

The study's findings support a greater application of social psychological theories and constructs to the field of trauma research, and health outcomes more widely. Jetten et al. (2012) argued that groups matter, not just in terms of social support and social networks, but that group *processes* matter. This study finds that higher group identification relates to increased perceived social acknowledgment, which in turn relates to lower posttraumatic cognitions and symptoms. The possible clinical benefits of such a finding are clear: If we can increase identification with well-functioning groups, we may be able to help lessen the traumatic response. Joining a well-functioning group has known health benefits, strongly identifying with it appears to bring many more.

Following longitudinal studies of the role of identification with specific groups implicated in health and mental health outcomes (e.g., family, survivor groups, support groups, rehabilitation groups), lab-based group identification manipulations are required to establish how we increase identification with these specific well-functioning groups for specific high-risk groups (i.e., trauma survivors). Groups4Health (G4H, Haslam et al., 2016) is a psychological intervention aimed at improving health by empowering people to develop social group memberships. The programme is derived from the social identity framework that seeks to improve health through increased group identification.

Tested in young adults experiencing social isolation, higher levels of mental health, loneliness, self-esteem and life-satisfaction were measured six months after the intervention (Haslam et al., 2016, p. 20). The adaptation of this intervention for those who have experienced specific traumas is likely to be clinically beneficial.

Conclusion

In conclusion, this research provides support for the relevance and usefulness of a social model of trauma. We aimed to explain a significant amount of variance in PTSS, and have explained nearly a third through the social mediation model. The study illustrates the importance of reviewing traditional social support constructs, and applying a more dynamic, relational, approach to our consideration of trauma response. By incorporating social identity processes (especially group identification) into the model, the paper also illustrates the potential benefits of the possibility of using group process research to increase our understanding of the impact of social factors in a posttraumatic context. Outside of the lab, trauma-specific applied interventions are critical

Chapter 4

Group identity may protect against trauma: evidence from a military sample

Woodhouse, S., & Brown, R. (2018). Group identity may protect against trauma: evidence from a military sample.

Abstract

War veterans can experience high levels of posttraumatic stress symptoms and cognitions. This survey of a sample of traumatised treatment seeking veterans ($N = 38$) explores the relationships between veteran group identification, social support, posttraumatic cognitions and posttraumatic stress symptoms. Veteran identification was negatively associated with both posttraumatic cognitions and symptoms. Social support may partially mediate those relationships. The relationship between veteran identification and posttraumatic cognitions remained significant even controlling for fearful attachment style. This suggests that a group ('veteran') identity may act as a protective factor in posttraumatic contexts

Key words: Posttraumatic Stress; posttraumatic cognitions; veteran identification; group identification; social support; social cure

Introduction

The impact of war

Studies of American veterans returning from Iraq and Afghanistan suggest that combat exposure is linked to increased rates of mental illness, particularly posttraumatic stress disorder (PTSD) (Hoge, Auchterlonie, & Milliken, 2006; Hoge et al., 2004).

Lifetime prevalence of combat-related PTSD is found to be as high as 17% in US veterans and 6% in UK veterans (Richardson, Frueh & Acierno, 2010). Posttraumatic Stress Symptoms (PTSS) are grouped into four categories: re-experiencing and intrusions, avoidance/numbing of emotions, increased arousal and negative cognition/mood. They are a normative response to experiencing or witnessing a traumatic event. Symptoms persisting beyond four weeks post-trauma lead to a diagnosis of PTSD. High PTSS and PTSD prevalence rates in veterans are unsurprising as active duty is likely to involve combat patrols in horrific, life-threatening, situations. Large-scale population studies find that men who report combat as the worst trauma they have experienced were more likely to have lifetime PTSD, delayed PTSD symptom onset, and unresolved PTSD symptoms, and to be unemployed, fired, divorced, and physically abusive to their spouses than men reporting other traumas as their worst experience (Prigerson, Maciejewski & Rosenheck, 2001).

In non-military populations there is evidence that strong group identification is associated with lower trauma symptoms (Muldoon & Downes, 2007; Woodhouse, Brown & Ayers, 2017). In this paper we seek to explore whether a strong veteran identity may also operate as a protective factor following trauma in military contexts. Such a finding would contribute to a growing research literature focusing on the beneficial physical and mental health benefits of group identities, the so-called Social Cure approach (Jetten, Haslam & Haslam, 2012).

Social identity theory

Jetten and her colleagues (2012) use social identity theory to argue that in certain circumstances, individuals move from considering themselves 'I' to considering themselves 'we' (Tajfel & Turner, 1986). Social identity theory explains that well-functioning groups provide individuals with clear self-definition, a sense of belonging and a set of norms which guide behaviour and, potentially, confer benefits for individual health and well-being.

There is now increasing evidence that participating in and identifying with well functioning groups benefits our physical and mental health (Jetten et al, 2014). High group identification has been linked with high life satisfaction (Wakefield et al., 2016), a heightened sense of belonging (Easterbrook & Vignoles, 2013) and control and capability (Greenaway et al., 2015). Evidence of the health benefits of strong group identification have been shown in patients recovering from strokes (Haslam et al., 2008), the elderly (Gleibs, Haslam, Haslam & Jones, 2011), heart surgery (Haslam et al., 2005), and among prison guards (Sani, Magrin, Scignaro, & McCollum, 2010). The benefits of group identification in posttraumatic contexts have not been greatly explored, although Woodhouse, Brown and Ayers (2017) have found a negative association between group identification and PTSS amongst a heterogeneous sample of traumatised individuals.

At this point, what underlies these benefits of group identification is not well understood but one possible mediating variable might be social support. People who identify strongly with a group may actually – or expect to - receive social support from their fellow group members. Haslam, O'Brien, Jetten, Vormedal and Penna (2005) studied three groups exposed to high levels of stress: patients recovering from heart

surgery, bomb disposal officers and bar staff. Path analysis indicated that social support was a significant mediator of the negative relationship between social identification and stress. Such a finding is consistent with decades of research demonstrating that high levels of social support are beneficial to health (e.g., Cohen et al., 1997, 2004; House et al, 1988; Tomaka et al., 2006). Haslam et al. (2018) propose that, following a potentially stressful situation, social identities may act as a ‘buffer’ to stress by affecting both the primary (‘Is this situation a threat to me?’) and secondary (‘If so, can I cope with the threat?’) appraisal processes (Lazarus & Folkman, 1984). The secondary appraisal process involves an assessment of the individual’s resources and social support. Salient social identities are therefore said to provide a ‘buffer’ to stress by helping an individual consider themselves as part of a well-functioning group and affecting how positively they assess their social support (e.g. Hausser, Kattenstroth, van Dick, & Mojzisch, 2012). In the research reported here, we investigate further the role of social support as an explanatory mechanism.

Social Identity Theory assumes that specific group identities become salient in particular social contexts, although for some, certain identities can become chronically salient (Tajfel & Turner, 1986). For ex-soldiers, although several groups may be available for them to identify with, their identity as a ‘veteran’ is likely to be important for many, albeit to varying extents. The social identity model of identity change (SIMIC) suggests that because our sense of self is comprised of various social identities, any shift in these identities can affect well-being (Jetten, Haslam, & Haslam, 2012). We could therefore expect changes in identity (from soldier to veteran, and/or from soldier to traumatised soldier) to affect well-being. Burdett et al. (2012) interviewed ex-UK military personnel in service at the time of the 2003 Iraq war and found that fifty percent of the sample would describe themselves as a veteran. Level of

education and being a full-time regular (rather than a reservist) were both associated with self-identification as a veteran. Firmin et al. (2016) investigated veteran identity and perceptions of self, illness and treatment among veterans and non-veterans with schizophrenia. They found that veterans were more likely than non-veterans to want to be 'normal', to have a military mindset, to be optimistic towards the future, to resist stigma, and to have 'active' treatment attitudes. Despite these results, it cannot be assumed that a veteran identity will always lead to better health and well-being outcomes. Research into the circumstances under which social identities can become 'social curses' rather than social cures is also relevant (Kellezi and Reicher, 2012). The veteran identity studies, together with findings from the Social Cure literature that link group identification to well-being (Jetten, Haslam & Haslam, 2012), justify this study's exploration of the role veteran identification may, or may not, play in recovery from trauma.

Posttraumatic cognitions

Ehlers and Clark's (2000) influential model of PTSD proposes that negative cognitions and appraisals are the primary mechanisms underlying persistent long term PTSS/D. Considerable evidence now supports this (Dunmore, Clark, & Ehlers, 1997; Ehling, Ehlers, & Glucksman, 2006; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999), and treatment aimed at reducing posttraumatic cognitions to reduce PTSS appears successful (Kleim et al., 2013). In 2013, the importance of negative cognitions was formally acknowledged through their inclusion in the diagnostic criteria for PTSD (DSM V, American Psychological Association, 2013).

Evidence suggests that social support is negatively associated with posttraumatic cognitions (Ford, Ayers & Bradley, 2010; Robinaugh et al., 2011;

Woodward et al., 2015). Ford, Ayers and Bradley (2010) found that PTSD after childbirth was negatively associated with social support. Woodward et al. (2015), in a sample of 170 people who had experienced intimate partner violence and 280 motor accident victims, found that support from family and friends – as opposed to support from a single close other – was negatively associated with cognitions, which in turn positively related to PTSD. In their study of treatment-seeking survivors, Belsher et al. (2012) found that the relationship between posttraumatic cognitions and PTSD was mediated by social constraints (any social condition that causes a trauma survivor to feel they may not express their true feelings, thoughts and concerns).

Adult attachment style

It is widely accepted that an adult's attachment style is a significant risk or resilience factor within a posttraumatic context. In a meta-analytic review, Woodhouse, Ayers and Field (2015) found that attachment categories comprised of high attachment anxiety – in particular, fearful attachment – most strongly related to high levels of PTSS. These results are replicated within veteran samples. Ferrajão and Oliveira (2015) analysed the role of attachment anxiety and attachment avoidance as mediators of combat exposure onto PTSD in a Portuguese veteran sample. The sample was divided into two groups: thirty still suffered from chronic PTSD and thirty had remission from PTSD. Results revealed higher attachment anxiety among those still suffering from PTSD. Attachment anxiety was also found to mediate the relationship between combat exposure and PTSS. Horesh et al. (2014) examined the long-term impact of stressful life events for 664 insecurely (anxious versus avoidant) attached Israeli war veterans from the 1982 Lebanon war. Results indicated a positive correlation between insecure attachment and PTSS. Here, we will investigate whether associations between veteran

identification and trauma symptoms persist whilst controlling for attachment style. Such a finding would indicate that group identification can have independent protective effects against trauma.

Study objectives

(1) to investigate whether veteran identification is associated with posttraumatic cognitions and PTSS; (2) to explore whether social support mediates that relationship; (3) to establish whether veteran identification relates to posttraumatic cognitions and/or PTSS when controlling for fearful/secure attachment.

Method

Design

A cross-sectional study of treatment seeking war veterans. Veteran group identification, social support, adult attachment styles, posttraumatic cognitions and posttraumatic stress symptoms (PTSS) were assessed using self-report measures.

Participants

Participants ($N = 38$; $M = 35$, $F3$; mean age 45 years, range 28-68, $SD = 11.42$) were seeking treatment for Posttraumatic Stress Disorder (PTSD) from a UK veterans' charity. To be eligible for the study participants had to be over eighteen years old, be fluent in English and have been accepted for treatment. All participants were veterans of the UK armed forces. Mean time served in the forces was 11 years (*Range*: 0-31, $SD = 7.12$), and the mean longest deployment was 12 months (*Range*: 0-72, $SD = 13.62$). All participants were seeking treatment for the effect of traumatic event(s) which took place during their military service and 85% of participants classed the traumatic events as 'military trauma'. Approximately 50%, of participants ($N = 17$) also classified the traumatic event as 'interpersonal' (the event took place between people and/or is perceived to have been caused by another human being). The mean number of traumatic events experienced was 5 (*Range*: 1-10+, $SD = 3.87$). The mean time elapsed since the traumatic event(s) took place was 17 years (*Range*: 0-50+, $SD = 14.81$).

Measures

All measures used a 0 – 5 response format, unless otherwise indicated. Please see Table 1 for means, standard deviations and range information.

Veteran identification. Four items adapted from Leach et al. (2008) and Cameron (2004) were used to assess how strongly participants identified with being a veteran: ‘I see or communicate with other veterans frequently’, ‘I feel strong ties to other veterans’, ‘I often regret that I am a veteran’, ‘In general, being a veteran is an important part of my self-image’; (‘totally disagree’ to ‘totally agree’, high scores representing high levels of veteran identification; $\alpha = .70$).^{vii}

Social support. The eight top-loading items from Joseph et al.’s (1992) Crisis Support Scale were used to assess overall social support. Items: ‘Were people sympathetic and supportive just after the event?’, ‘Are people sympathetic and supportive at the present time?’, ‘Were people helpful in a practical sort of way just after the event?’, ‘Are people helpful in a practical sort of way at the present time?’, ‘Whenever you wanted to talk, how often was there someone willing to listen just after the event?’, ‘Whenever you want to talk how often is there someone willing to listen at the present time?’, ‘Were you able to talk about your thoughts and feelings just after the event?’, ‘Are you able to talk about your thoughts and feelings at the present time?’, (‘never’ to ‘always’, high scores representing high levels of overall support; $\alpha = .83$).

Adult attachment. Bartholomew and Horowitz’s (1991) five-item measure was chosen to measure attachment. It presents short descriptions of the four different attachment styles (secure, fearful, preoccupied and avoidant), and asks participants to rate how much the description describes their general relationship style on a seven-point likert-scale. Participants are asked to choose one description which best describes them. Example description of fearful attachment style: ‘I am uncomfortable getting close to

others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others'. Response scales ranged from 0 (strongly disagree) to 7 (strongly agree), and high scores represent high levels of the measured attachment style. Scale reliability cannot be calculated for this measure as items are used individually and measure incompatible constructs.

Posttraumatic cognitions. The ten top loading items from the original Posttraumatic Cognitions Inventory (PTCI, Foa et al., 1999) were used. Five items were from the 'negative cognitions about self' factor, three from 'negative cognitions about world', and two from 'self-blame'. Items: 'People can't be trusted', 'My life has been destroyed by the trauma', 'You can never know who will harm you', 'I will never be able to feel normal emotions again', 'I have permanently changed for the worse', 'The event happened because of the way I acted', 'I can't deal with even the slightest upset', 'I have no future', 'My reactions since the trauma show that I'm a lousy copier', 'There is something about me that made the event happen.'. Response scale ranged from 1 (totally disagree) to 7 (totally agree), and high scores represent high levels of posttraumatic cognitions. ($\alpha = .86$).

Posttraumatic stress symptoms. The twenty-item PTSD Checklist (PCL-5; Weathers et al, 2013) assessed the DSM-5 (Diagnostic and Statistical Manual V, 2013) symptoms of PTSD. The items asked how much people were bothered by certain symptoms in the past month (e.g., 'Repeated, disturbing dreams of the stressful experience?' 'Blaming yourself or someone else for the stressful experience or what happened after it?' 'Being "super-alert" or watchful or on guard?'). Response scale ranged from 0 (a little bit) to 4 (extremely), and high scores represent high levels of posttraumatic cognitions ($\alpha = .89$).

Procedure

Participants were veterans accepted for treatment by a UK veteran's charity. Veterans could self-refer for treatment, or were referred by local general practitioners. The charity offers a course of six psychotherapeutic sessions. Once accepted for treatment the veteran was allocated to one of the charity's network of accredited therapists.

Participants were recruited by the charity during the administrative process of accepting an individual for treatment. Once they had agreed to participate, participants received a secure online link via email. When they clicked on the link they were presented with study information, taken through the inclusion and exclusion criteria, and asked to formalise consent. Three participants did not use the online portal and were also once again taken through the study information, inclusion and exclusion criteria, and formally asked to consent (in writing for the postal version, and read aloud to those who chose to go through the survey on the phone).

The research project satisfied British Psychological Society (BPS) ethical guidelines and was approved by the university's internal Research Ethics Committee. Participant data was held in accordance with the 1998 Data Protection Act, and strict confidentiality procedures were followed.

Results

Overview

Pearson bivariate correlations among all variables are reported. Multiple regression was then used to investigate the multivariate associations between various ‘predictor’ measures and the outcome variables (relating to trauma). These also permitted some tests of possible mediating processes.

Sample characteristics and intercorrelations

As can be seen from Table 1, posttraumatic stress symptoms within the sample were high, as were posttraumatic cognitions. Mean veteran identification was around the mid-point of the scale.

As expected, veteran identification correlated negatively with both posttraumatic cognitions and PTSS. There were also correlations between veteran identification and social support (+), between social support and posttraumatic cognitions (-), and between social support and PTSS (-), consistent with the possible role of social support as a mediator.

Table 1Cross-sectional correlations between the principal variables in the study; * = $p < .05$; ** = $p < .01$

	1	2	3	4	5	6	7	8	9	10
1. PTSS	-	.76**	-.43**	-.38*	-.30	.38*	.21	-.17	.22	-.19
2. PTCI		-	-.52**	-.44*	-.39*	.50**	.11	-.28	-.03	-.11
3. Overall support			-	.32	-.34*	-.31	-.32	.08	-.36*	.09
4. Veteran identity				-	.43**	-.25	-.11	.10	.08	.01
5. Secure					-	-.30	.10	.09	.06	-.08
6. Fearful						-	.16	-.06	.07	-.19
7. Age							-	.05	.73**	.01
8. Time served (years)								-	-.14	-.24
9. Time since (years)									-	.01
10. Interp. trauma (binary)										-
Means	60.33	29.51	15.61	11.32	1.08	3.35	44.90	11.32	17.41	.51
Std. deviation	12.44	10.68	8.60	5.85	1.40	1.75	1.42	7.12	14.81	.51
Range - max	80.00	49.00	34.00	20.00	5	5	67.71	31	50	1
Range - min	28.00	2.00	.00	.00	.00	.00	27.95	.00	.00	0
N	33	35	38	37	37	37	36	38	35	35

Multiple regression analyses

Because of the relatively small sample, it was not prudent to include too many independent variables in each model.

To address objective 1, veteran identification was regressed onto posttraumatic cognitions and then, separately, onto PTSS. Veteran identification was associated with posttraumatic cognitions, $b = -.34$, $SE = .12$, $p < .01$, and explained approximately 20% of the variance in posttraumatic cognition scores, $R^2 = .20$, $F = 8.85$, $p < .01$. Veteran identification also correlated with PTSS, $b = -.19$, $SE = .08$, $p < .05$, and explained approximately 14% of the variance in PTSS levels, $R^2 = .14$, $F = 5.89$, $p < .05$.

In relation to objective 3, analysis indicated that veteran identification remained a significant correlate of posttraumatic cognitions, $b = -.23$, $SE = .10$, $p < .05$, even when controlling for fearful attachment style, which was also a significant predictor, $b = .25$, $SE = .09$, $p < .01$. Together, these two variables accounted for approximately 35% of variance in posttraumatic cognitions, $R^2 = .35$, $F = 9.10$, $p < .01$. The regression was re-run with PTSS as the dependent variable. Although veteran identification was not a significant predictor of PTSS once fearful attachment was controlled for, it was on the cusp of significance, $b = -.12$, $SE = .07$, $p = .07$.

To investigate the possibility that social support may mediate the effect of veteran identification on posttraumatic cognitions and/or PTSS (objective 2), the four-step Baron and Kenny (1986) procedure was followed to test the mediation. The Hayes (2012) PROCESS macro was then used to test the significance of the indirect effects. The four regressions are reported in Table 2 and Table 3.^{viii}

Table 2

Summary of four-step multiple regressions to test whether overall support mediates the relationship between veteran identification and posttraumatic cognitions; all variables were mean centred, * = $p < .05$, ** $p < .01$

	Step 1 (DV = PTCI)			Step 2 (DV = Support)			Step 3 (DV = PTCI)			Step 4 (DV = PTCI)		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Veteran identification	-.34**	.12	-.44	.23*	.12	.32 ^{ix}				-.24*	.11	-.31
Overall support							-.54**	.15	-.52	-.44**	.15	-.42
R^2		.20			.10			.27			.36	
<i>F</i>		8.85			4.10			13.19			9.65	

Table 3

Summary of four-step multiple regressions to test whether overall support mediate the relationship between veteran identification and Posttraumatic Stress Symptoms (PTSS); all variables were mean centred, * = $p < .05$, ** $p < .01$

	Step 1 (DV = PTSS)			Step 2 (DV = Support)			Step 3 (DV = PTSS)			Step 4 (DV = PTSS)		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Veteran identification	-.19*	.08	-.38	.23*	.12	.32 ^x				-.14	.08	-.26
Overall support							-.30**	.10	-.43	-.24*	.11	-.35
R^2		.14			.10			.19			.25	
<i>F</i>		5.89			4.10			8.33			5.86	

As can be seen in Table 2 and Figure 1, in the final model (step four), social support and veteran identification were both significant predictors of posttraumatic cognitions, consistent with partial mediation. The indirect effect was tested using Hayes (2012) PROCESS bootstrap estimation approach. The indirect effect of veteran identification onto posttraumatic cognitions via the social support mediator was significant, $b = -.06$, $SE = .04$, 95% CI = $-.1560, -.0030$.

The same analysis was conducted for PTSS (see Table 3 and Figure 2). In the fourth step, the social support mediator remained a significant predictor of PTSS. However, veteran identification is no longer a significant predictor of PTSS. Results are consistent with full or partial mediation. The indirect effect was tested using Hayes (2012) PROCESS bootstrap estimation approach. The indirect effect of veteran identification onto PTSS via the social support mediator was significant, $b = -.06$, $SE = .04$, 95% CI = $-.1619, -.0070$.^{xi}

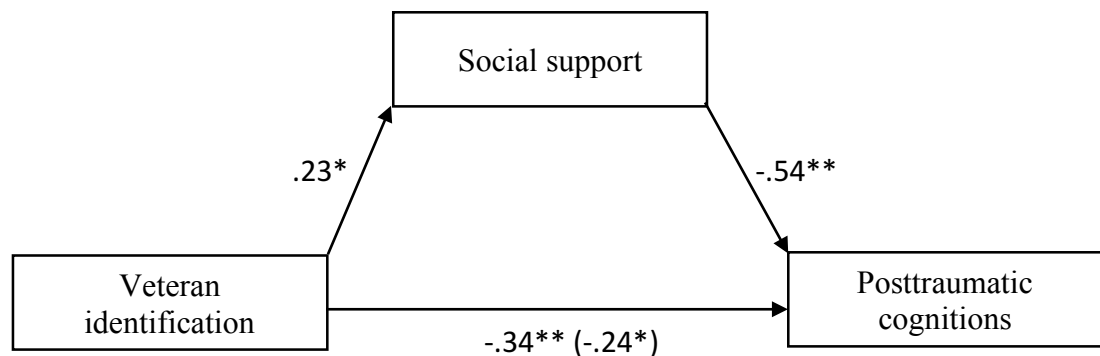


Figure 1. Cross-sectional mediation model, veteran identification on posttraumatic cognitions via social support. The direct effect of veteran identification on cognitions whilst controlling for the social support mediator is included in parenthesis. See Table 2 for full regression model, * = $p < .05$, ** $p < .01$

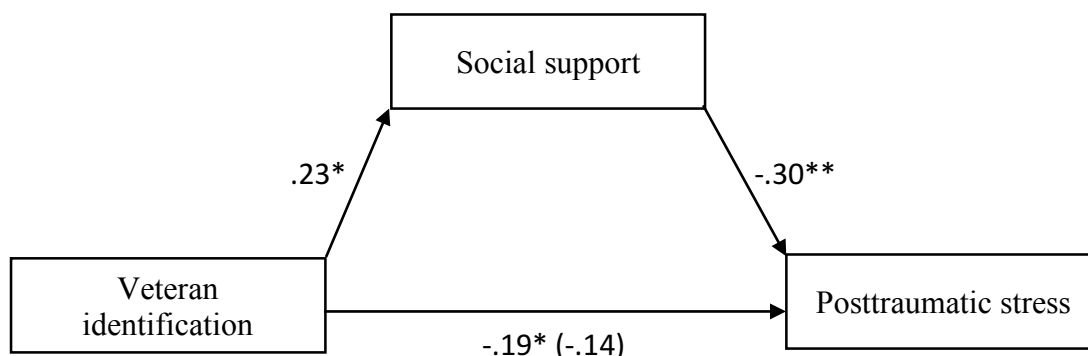


Figure 2. Cross-sectional mediation model, veteran identification on posttraumatic stress symptoms via social support. The direct effect of veteran identification on trauma symptoms whilst controlling for the social support mediator is not significant, and is included in parenthesis. See Table 3 for full regression model, * = $p < .05$, ** $p < .01$

Discussion

This study aimed to explore the utility of group identification within a posttraumatic veteran context. Results reveal that veteran identification is consistently and negatively associated with both posttraumatic cognitions and posttraumatic symptoms (PTSS). The relationship with posttraumatic cognitions appears to remain significant even when controlling for fearful attachment style – a well known dispositional predictor of posttraumatic symptoms. The effect of veteran identification on both posttraumatic cognitions and PTSS appears to be partially mediated by social support.

These findings highlight the possible protective role strong group identification may play in a posttraumatic environment, as indicated by previous research (Woodhouse, Brown & Ayers, 2017). More specifically, in the post-combat veteran context, it points to the possible protective role a strong *veteran* identity may play. These findings are consistent with previous research investigating the ‘Social Cure’ in other non-traumatised samples, and therefore indicate that group identification may be protective within a wide number of physical and mental health contexts. Results validate the idea that at least some of the benefits of group identification relate to social support. The mediation effect, also reported by Haslam et al. (2005), suggests that people who identify strongly with a group may either perceive higher levels of social support or actually receive higher levels of support. Whether expected or actual, it seems that health benefits ensue.

This study has two main strengths. First, the study draws from a hard-to-reach, unique sample. Second, the application of social identity theory and group identification processes within a post-combat veteran context is novel. However, we acknowledge two limitations. First, the cross-sectional design means that inferences about causality are ambiguous. Second, the small sample size also means the results need to be viewed with caution.

Taken together, the strengths and limitations indicate the need for further research. A longitudinal study with a larger veteran sample would be most beneficial to give more confidence about the associations reported here and to allow the possibility of limited causal inference. In conclusion, this research provides support for the usefulness of group identification in posttraumatic environments, and underlines the value of a strong veteran identity in post-combat contexts. If confirmed in subsequent

research, the findings would suggest the practical utility of developing the role of veterans' associations to foster a stronger and potentially protective veteran identity.

Chapter 5

A longitudinal study of the impact of adult attachment and group identification on postnatal posttraumatic cognitions/symptoms and well-being after birth

Woodhouse, S., Brown, R., & Ayers, S. (2018). A longitudinal study of the impact of adult attachment and group identification on postnatal posttraumatic cognitions/symptoms and well-being after birth.

Abstract

Childbirth and the transition to motherhood is a life-changing event for most women. Over 4% of women develop postpartum posttraumatic stress disorder (PTSD) and between 10-15% develop postpartum depression. Support has been consistently found to relate to well-being after birth, and to posttraumatic stress symptoms (PTSS) in various samples. This prospective longitudinal study aimed to better understand support in the perinatal period by examining the effect of adult attachment and group identification (family and friends vs antenatal group) on women's postnatal mental health and wellbeing. Women were recruited from the UK's leading provider of private antenatal support groups ($N = 712$). Measures of adult attachment, group identification (antenatal group and family/friends), self-efficacy, social support, support during labour, psychological well-being, general distress, posttraumatic cognitions and posttraumatic symptoms, were taken at the end of pregnancy (Mean 36.5 weeks gestation, $SD = 3.4$ weeks) and again ten weeks after birth (Mean 10 weeks postnatally,

SD = 4.3 weeks). Fearful adult attachment style was found to longitudinally relate to posttraumatic cognitions, general distress and psychological well-being. The longitudinal relationship between fearful attachment and well-being was mediated via both strength of identification with family and friends and general self-efficacy. Postnatally, the relationship between identification (family/friends and antenatal group) and PTSS was mediated by social support. Strength of group identification during pregnancy (family/friends and antenatal group) related to postnatal well-being. The longitudinal relationship between antenatal group identification and postnatal well-being was mediated by perceived support during labour. Results support the continued examination of the role of group identification and adult attachment in the perinatal period.

Keywords: Group identification, posttraumatic cognitions, posttraumatic stress symptoms, well-being, birth, attachment, self-efficacy, social support.

Introduction

Pregnancy, birth, and the immediate postpartum are common life events, but are also life-changing events for the women involved. Between 20-30% of women experience a traumatic birth, as defined by DSM Criterion A (Diagnostic and Statistical Manual IV & 5, Am. Psych. Assoc., 2000, 2013; Ayers, Harris, Sawyer, Parfitt, & Ford, 2009; Ayers, Wright, & Thornton, 2018; Creedy, Shochet, & Horsfall, 2000), and 4% go on to develop PTSD (Dikmen-Yildiz, P., Ayers, S., & Phillips, L., 2017). Well-being immediately after birth can be greatly compromised (O'Hara & Swain, 1996). A recent report estimated that perinatal mental health problems cost the UK £8.1 per annual cohort of women, with 72% of this cost being due to the long-term impact on the child (Bauer, Parsonage, Knapp, Iemmi & Adelaja, 2014). There is considerable evidence that social support robustly predicts higher quality of life postnatally (e.g., Emmanuel, St John, & Sun, 2012). This paper aims to examine specific constructs likely to be antecedent to social support: adult attachment and group identification. We also aim to better understand certain consequences of social support – higher self-efficacy – which is known to provide psychological resilience after a trauma (Blackburn & Owens, 2015; Bosmans & van der Velden, 2015), and therefore may be protective in a posttraumatic context. We address these aims by studying a large longitudinal sample of women participating in the UK's leading private antenatal support group.

Perinatal well-being and mental health

The transition to motherhood affects women's mental and physical health (Munk-Olsen, Larsen, Pedersen, Mors & Mortensen; Webb et al., 2008), identity (Heisler & Ellis, 2008; Smith, 1999), work patterns (Chung & van der Horst, 2018), leisure time and relationships (Claxton & Perry-Jenkins, 2008). Labour and birth are physically and mentally challenging, and up to 30% of women find it to be a traumatic experience (Creedy et al., 2000). Immediately after birth, women's psychological and physical well-being is often compromised, with between 10 and 15% of women experiencing postpartum depression (O'Hara & Swain, 1996), and 4% developing postpartum PTSD (Dikmen-Yildiz et al., 2017). PTSD is a specific set of prolonged symptoms experienced in response to a very stressful event. The disorder historically consisted of three types of symptoms: re-experiencing and intrusions; avoidance/numbing of emotions; and increased arousal. A fourth symptom cluster of negative cognitions and mood was added in the latest revision of diagnostic criteria (DSM5, Am. Psych. Assoc., 2013). Risk of developing postpartum PTSD is higher in women with a history of PTSD and mental illness, who were depressed in pregnancy, and had a fear of childbirth, as well as those who had a negative birth experience, had an operative birth (assisted vaginal or caesarean) or who experienced dissociation during the labour (Ayers, Bond, Bertullies, & Wijma, 2016). Low levels of social support are a risk factor for both postpartum PTSS (Furuta, Sandall, Cooper, & Bick, 2016) and postpartum depression (see O'Hara, 2009).

Support during the perinatal period

At such a significant time in women's lives, social support plays an important role, as it does in other health areas and during major life transitions. The perinatal period is one of transition, and this transition often involves significant changes in relationships, and changes in support needs and networks (Leahy-Warren, McCarthy & Corcoran, 2011). Familial support may only be available over long distances and sporadically due to modern changes in how near 'home' mothers-to-be may live (Heisler & Ellis, 2008, p. 446). Private and government-funded antenatal/postnatal education groups are common during pregnancy and into motherhood, and peer support can be critical for socially isolated women (McLeish & Redshaw, 2017). Partner support, connecting with other women via peer support, and simply having somewhere to go may be particularly important for isolated women who experience low mood or depression during pregnancy (Raymond, 2009). The effect of perinatal peer support and antenatal education appears to be relatively well studied in vulnerable high-risk populations. Less appears to be published about the effect of different types of support and antenatal education in the general population.

Social support has been found to be a significant and consistent predictor of higher quality of life, particularly in the physical domain, at twelve weeks postpartum, and in the mental domain across the perinatal period (Emmanuel et al., 2012). Ford, Ayers & Bradley (2010) tested a cognitive model of PTSS within a sample of women following childbirth, and considered the effect of adding social support to the model. Social support after birth increased the explanatory power of the model at three months postpartum. In support of these findings, Negron, Martin, Almog, Balbierz, and Howell's (2013) qualitative focus group analyses found that women identified receipt of instrumental support as essential to their physical and emotional recovery after

childbirth. In the prenatal period, there is evidence that good social support may help strengthen women's relationships with their partners and facilitate feelings of calm about childbirth and parenting (Backstrom et al., 2017), whereas low social support during this time may negatively influence birth outcomes and relates to low maternal well-being (Elsenbruch et al., 2006). Moreover, perceived support during labour has been found to relate to lower trauma symptoms postnatally (Ford & Ayers, 2011).

Adult attachment and birth

Adult attachment refers to an adult's relationship style. These styles are broadly categorised into either 'secure' or 'insecure', with insecure being further divided into more specific categories (fearful, preoccupied and dismissing). All categories are based on two continua: anxious and avoidant relationship feelings/behaviours (Fraley, 2002). The higher-order categories of secure and insecure are widely used colloquially, with adults often referred to as either secure or insecure within relationships. Adult attachment styles are drawn directly from Bowlby's (1982) attachment theory as it applies to infants. The theory illustrates how unreliable, inconsistent or neglectful responses from caregivers will lead to insecurely attached infants. Conversely, securely attached children are in receipt of reliable, consistent and attentive responses (Bowlby, 1982; Ainsworth, Blehar, Waters, & Wall, 1978). These infant-caregiver relationship patterns are well-observed in adult relationships too (Bartholomew & Horowitz, 1991; Fraley, 2010), and relate to self-efficacy (Wei, Russell, & Zakalik, 2005), coping, well-being, stress response, cortisol response, health behaviours and social functioning (Landen & Wang, 2009; Meredith, Strong & Feeney, 2006; Kidd, Hamer & Steptoe, 2013; Wu & Yang, 2012).

Woodhouse, Ayers & Field's (2015) meta-analytic study found that secure adult attachment consistently negatively, and insecure attachment positively, relates to PTSS. Of all the attachment styles, fearful attachment was found to relate to the highest levels of PTSS following a trauma. There is also evidence that adult attachment style relates to PTSS after birth (Ayers, Jessop, Pike, Parfitt, & Ford, 2014). Of further relevance, in a path model, adult attachment has been found to relate to posttraumatic cognitions and symptoms via group identification in a heterogeneous sample of traumatised people (Woodhouse, Brown & Ayers, 2018).

Group identification

Seymour-Smith, Cruwys, Haslam and Brodribb (2017) propose the use of social identity theory as a means of better understanding support in the perinatal period. Group identification refers to people's evaluation of, and attachment to, a particular group they belong to (Tajfel, 1978) – in short, how important the group is to them. Jetten, Haslam, and Haslam (2012) propose that the groups we are part of can have a positive impact on our mental and physical health by providing members of the group with a clear self-definition, a sense of belonging and norms that will guide behaviour. This emerging research tradition has been called the *Social Cure* by its proponents (Haslam, Jetten, Cruwys, Dingle, & Haslam, 2018; Jetten, Haslam, & Haslam, 2012). In the case of a well-functioning antenatal education/support group, we would expect an identification with it to positively influence pregnant women by, for example, offering norms such as 'we do not drink alcohol during pregnancy', or to impact physical health behaviours by, for example, meeting for exercise twice a week. In this example, we would expect women who are highly identified with the group to reap more positive health benefits than women who are only loosely identified with the group. For the purpose of this

study, we are interested in two groups that are operating during the perinatal period to support women: antenatal groups and close groups of family and friends. The application of the ‘social cure’ approach to help us understand how group identification may affect mental health and well-being in the perinatal period appears to be relatively novel.

The health and well-being benefits of a strong identification with a well-functioning group have been observed in people who have experienced a traumatic event (Woodhouse, Brown & Ayers, 2018), in people with depressive symptoms (Cruwys, Dingle, Haslam, Haslam, Jetten & Morton, 2013), recovering stroke patients (Haslam, Holme, Haslam, Iyer, Jetten & Williams, 2008) and the elderly (Gleibs, Haslam, Haslam, & Jones, 2011). In a cross-sectional online study of postpartum women, Seymour-Smith et al. (2017) found that, when controlling for group memberships prior to birth, a decrease in group memberships after having a baby was associated with an increase in depressive symptoms. They also found that maintaining pre-existing group memberships was predictive of better mental health, and identification as a mother was a strong positive predictor of mental health in the postpartum period. Seymour-Smith et al. (2012) apply the social identity model of identity change (SIMIC) to childbirth and the postpartum. The model illustrates that because our sense of self is comprised of our social identities, any changes to our social identities will affect our well-being. They successfully demonstrate that the model is particularly relevant in the context of childbirth, or indeed any traumatic event, as these events themselves often involve a shift in identity (e.g., to a mother in the case of childbirth). Their findings highlight the relationship between identity processes and well-being in a perinatal context, and the changing nature of social identities in the postpartum.

Various mechanisms that might underlie these effects have been proposed. Perception of social support, self-esteem, meaning, purpose, control and efficacy have all been highlighted as psychological resources that can result from a shared identity (Haslam, Jetten, Cruwys, Dingle & Haslam, 2018). Haslam, O'Brien, Jetten, Vormedal and Penna's (2005) study of groups that are exposed to high levels of stress (post-operative heart surgery patients, bomb disposal officers and bar staff) found that social support was a significant negative mediator of the relationship between group identification and stress. People who more strongly identify with a group may either receive or perceive higher levels of social support, and this in turn leads to higher well-being and lower stress. This is consistent with transactional models of stress (Lazarus & Folkman, 1984) which illustrate that following a potentially stressful event, the secondary appraisal process ('Can I cope with the situation?') involves an assessment of social support. In relation to control and efficacy, Haslam et al. (2018) draw attention to Greenaway et al.'s (2015) analysis of the World Values Survey data, which encompassed 62,000 people in 47 countries. The analysis found that people report a higher sense of personal control if they more strongly identify with their community, their nation or humanity as a whole, and that this in turn relates to well-being. Given the well documented positive effects of both self-efficacy (e.g., Goto et al., 2010; Haslam, Pakenham, & Smith, 2006; Leahy-Warren & McCarthy, 2011) and social support in the perinatal period, both potential mechanisms are thus hypothesised to be mediators of the positive effects of group identification on well-being.

Previous studies have suggested that one way in which adult attachment may affect mental health and well-being is through its effect on group identification (Rosenthal, Somers, Fleming, & Walsh, 2014; Woodhouse, Brown, & Ayers, 2018). In an exploratory social model of PTSD, group identification was observed as a

mechanism through which adult attachment affected other social factors and posttraumatic cognitions and symptoms (Woodhouse, Brown, & Ayers, 2018).

Rosenthal, Somers, Fleming, and Walsh (2014) found that group identification partially mediated the relationship between attachment avoidance and depressive symptoms. To explain this finding, they refer to previous research which found higher levels of avoidance may be associated with negative appraisals of group members, and the dismissal of the potential benefits of group interactions (Rom & Mikulincer, 2003). Although appraisals and dismissal of group benefits may be involved in the relationship between avoidant attachment and group identification, no studies have explicitly examined this proposition. We speculate here that the attachment mechanisms of exploration (using a care-giver/romantic partner as a secure-base from which to explore the world) and internal working models of the self as worthy/unworthy in relation to others, could explain the observed association between attachment and group identification. For securely attached adults there may be few barriers to group identification; for insecurely attached adults with maladaptive exploratory tendencies and self-concepts of unworthiness in relation to others, group identification might be inhibited.

We previously explained the *social cure* proposition that group identification may affect health and well-being through changes to an individual's self-efficacy. Also of interest, given the empirical evidence linking attachment and self-efficacy (Corcoran & Mallinckrodt, 2011; Meredith et al., 2006; Wei et al., 2005), is whether self-efficacy may also mediate the relationship between attachment and maternal mental health and well-being. In a longitudinal study of 308 university students, Wei et al., (2005) found that social self-efficacy mediated the relationship between anxious attachment and feelings of loneliness and subsequent depression. Self-efficacy has been studied within

the context of social cure research and attachment research; here we hope to better understand its relationship with both constructs.

Partner organisation

To examine group identification and support in the perinatal period we partnered with the UK's largest provider of paid-for antenatal and postnatal courses. The charitable organisation provides information and support in pregnancy, birth and early parenthood through their website, literature, courses and local networks of practitioners and parents. Their antenatal course is the most popular course they provide, and is run nationally in hundreds of locations by employed practitioners. Women, and their partners, sign-up for a specific course, local to them, based on the due date of their baby, ensuring they are matched with other women/couples whose babies are due at roughly the same time. The course includes three or four antenatal sessions, and one postnatal meet-up session (which takes place once all the women on the course have given birth). The course focuses on preparing for labour and birth, and includes information on parenting a new-born baby. One of the primary aims of the course is to help new parents establish a local support network and friendships.

Current study

The general aim of this study is to contribute to a better understanding of social support in the perinatal period, with a particular focus on PTSS, distress and well-being after birth. Under that general rubric, the research had five specific objectives:

(1) to establish if women's dispositional adult attachment style relates to posttraumatic stress or cognitions; (2) to examine whether group identification with

family and friends and/or identification with the antenatal group relates to posttraumatic stress or cognitions and, if so, whether it operates via social support; (3) to examine whether adult attachment relates to psychological well-being or general distress; if this relationship exists, we hypothesise it is mediated by group identification and/or self-efficacy. We will examine two possible mediation pathways: firstly, a serial mediation (attachment to group identification to self-efficacy to well-being); secondly, a parallel mediation (attachment to well-being via both identification and self-efficacy); (4) to examine whether group identification with family and friends and/or identification with the antenatal group relates to well-being or general distress, and if so, whether it operates via social support; (5) to assess whether identification with family and friends, or identification with antenatal groups, most greatly benefits women in terms of their postnatal well-being and mental health. These objectives were investigated in a longitudinal study of women attending the UK's leading antenatal support group.

Method

Design

A longitudinal study of primigravida women attending antenatal education groups, with measures taken, once at the end of pregnancy and once approximately 10 weeks after birth (time 1: $M = 36.5$ weeks gestation, $SD = 3.4$ weeks; time 2: $M = 10$ weeks postnatally, $SD = 4.3$ weeks). Measures of adult attachment, group identification (antenatal group and family/friends), self-efficacy, social support, support during labour, psychological well-being, general distress, posttraumatic cognitions and posttraumatic symptoms, were taken at both time points.

Participants

A convenience sample of 712 women ($t1 N = 712 - 561$; $t2 N = 314 - 291$) was recruited via our partner organisation.^{xii} To be eligible for the study, participants had to be taking part in the partner organisation's primary antenatal course, pregnant with their first child, over eighteen-years-old and be fluent in English. The sample was predominantly Caucasian (90.5%), married or cohabiting (98.6%), and between 25 – 34 years of age. The majority were educated to university level (86.1%) and had a household income at least double the UK average of £26,300 (Office for National Statistics, 2017). The majority were employed on a full-time basis (86%). A large proportion (67%) had experienced a previous traumatic event, and a small number (1.6%) had previously been diagnosed with PTSD or another psychiatric disorder (7%).

Measures

Response format and scales. Unless otherwise stated, response scales ranged from 1 (strongly disagree) to 7 (strongly agree); high scores represent high levels of the measured psychological concept.

Antenatal group strength of identification. The extent to which participants identified with their antenatal support group was measured using the mean of three solidarity items, three centrality items and one satisfaction item from Cameron (2004), along with two satisfaction items from Leach et al. (2008). Example items: ‘I have a lot in common with other members of this group’ (Cameron, 2004), ‘I am glad to belong to this group’ (Leach et al., 2008) and ‘the fact that I am a member of this group rarely enters my mind’ (Cameron, 2004). Scale reliability: pregnancy $\alpha = .93$; after birth $\alpha = .95$.

Family and friends strength of group identification. The extent to which participants identified with their family and friends was measured using three of the same solidarity, centrality and satisfaction items as above: ‘The fact that I am a member of my family rarely enters my mind’ (Cameron, 2004), ‘I feel a bond with other members of my family’ (adapted from Cameron, 2004), ‘I am glad to belong to my family’ (Leach et al., 2008). These three items were then repeated using friends as the referent, rather than family. In the final analysis these six items were combined into one ‘family and friends’ identification measure. Scale reliability: pregnancy $\alpha = .86$; after birth $\alpha = .84$.

General self-efficacy. Items from Schwarzer and Jerusalem’s (1995) General Self-Efficacy Scale (GSE) were used. Due to concerns about participant overload, only five items (of a possible ten) were chosen: ‘Thanks to my resourcefulness, I know how to handle unforeseen situations’, ‘I can solve most problems if I invest the necessary

effort', 'I can remain calm when facing difficulties because I can rely on my coping abilities', 'If I am in trouble, I can usually think of a solution', 'I can usually handle whatever comes my way.' Choice of items was based solely on avoiding repetition (i.e., 'If I am in trouble, I can usually think of a solution' was used, and 'When I am confronted with a problem, I can usually find several solutions' was not used). Response scale ranged from 1 (Not at all true) to 4 (Exactly true). Scale reliability: pregnancy $\alpha = .84$; after birth $\alpha = .90$.

Birth experience. Women were asked in two single items about the nature of their birth experience. Women were first asked how they gave birth (homebirth, vaginal birth in midwifery-led unit, vaginal birth in hospital, elective caesarean, emergency caesarean). Women were then asked whether they underwent various interventions (induction, pain relief, assisted delivery using forceps or ventouse, blood transfusion, 'other, please specify'), response scales ranged from 1 (extremely unlikely) to 7 (extremely likely).

Support during labour. To establish how supported women felt during labour, women were asked how supported they felt by three key individuals (partner/spouse, midwife, doctor). Three items asked: 'How supportive were these people during labour and birth? (If the person was not present please mark N/A)'. As an optional fourth item, women could nominate 'other' and specify another individual who was at the birth, and were asked how supportive the individual was during labour and birth. Birth support items were only measured at time 2. Scale reliability: after birth $\alpha = .30$.

Adult attachment. Bartholomew and Horowitz's (1991) five-item Relationship Questionnaire (RQ) was chosen to measure attachment. It presents short descriptions of the four different attachment styles (secure, fearful, preoccupied and avoidant), and asks participants to rate how much the description describes their general relationship style

on a seven-point likert-scale. Participants are asked to choose one description which best describes them. Example description of fearful attachment style: ‘I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others’.

Social support. The seven-item ENRICH Social Support Inventory (ESSI) was used to measure social support (Mitchell et al., 2003). Example items: ‘Is there someone available to you whom you can count on to listen to you when you need to talk?’, ‘Is there someone available to help you with daily chores?’, ‘Do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide?’ Response scale ranged from 1 (never) to 5 (always). Scale reliability: pregnancy $\alpha = .73$; after birth $\alpha = .83$.

Psychological well-being. Because of the non-clinical, low trauma nature of the sample, psychological well-being was measured alongside posttraumatic symptoms and cognitions to enable us to pick-up on significant change overtime in the majority of participants. Diener et al.’s (2009) eight item Psychological Well-being Scale was used. High psychological well-being is defined by Diener et al (2009) as ‘optimal human functioning’, and reflects considerable research and theory in this area. High psychological well-being is comprised of meaning and purpose, supportive and rewarding relationships, self-acceptance and optimism, etcetera. Example items: ‘I lead a purposeful and meaningful life’, ‘People respect me’, ‘I am optimistic about my future’. Scale reliability: pregnancy $\alpha = .96$; after birth $\alpha = .96$.

General distress. The ten-item CORE-10 measure (Barkham et al., 2012), designed to assess common presentations of psychological distress in mental health settings, was administered. The measure is a short-form of the 34-item Clinical

Outcomes in Routine Evaluation-Outcome Measure (CORE-OM, Evans et al., 2000).

The CORE-10 taps into three domains of psychological distress: symptoms (depression, anxiety, physical and trauma), functioning (general and relationship), and risk to self.

Example items: ‘Over the last week I have felt tense, anxious or nervous’, ‘Over the last week I have felt able to cope when things go wrong’, ‘over the last week I have felt unhappy.’ Response scale ranged from 0 (Not at all) to 4 (Most or all the time). Scale reliability: pregnancy $\alpha = .74$; after birth $\alpha = .82$.

Posttraumatic cognitions. Seven items from the original thirty-three item Posttraumatic Cognitions Inventory (PTCI, Foa, Tolin, Ehlers, Clark, & Orsillo, 1999) were used at time 1. Items that referred to ‘the traumatic event’ could not be used during pregnancy as ‘the traumatic event’ (i.e., birth) had not happened. The seven items that did *not* refer to a specific traumatic event were chosen. Example items: ‘You can never know who will harm you’, ‘I can’t deal with even the slightest upset’, ‘I have no future’. At time 2 an additional five items were added based on their factor loading in the original measure development. These additional items were adapted from the PTCI to specifically refer to the birth. Example items: ‘My reactions since the birth show that I am a lousy copier’, ‘my life has been destroyed by my birth experience’, ‘Since the birth I have permanently changed for the worse.’ Scale reliability: pregnancy (7 items) $\alpha = .81$; after birth (12 items) $\alpha = .88$.

Posttraumatic stress symptoms. The twenty-item PTSD Checklist (PCL-5; Weathers et al., 2013) assessed DSM-5 symptoms of PTSD (Am. Psych. Assoc., 2013). The measure was adapted for pregnancy by excluding items that referred to an index trauma so it would be applicable to a normative sample. After birth, items referring to an index trauma were modified to refer to birth. At time 1 (before birth), eleven items that did not refer to a traumatic event were used; at time 2 (after birth) twenty items

were used. Items asked how much people were bothered by certain symptoms in the past month. Example time 1 items: ‘Feeling distant or cut off from people?’, ‘Irritable behaviour, angry outburst, or acting aggressively?’, ‘Loss of interest in activities you used to enjoy?’ Example time 2 items: ‘Repeated, disturbing, dreams of the birth experience?’, ‘Feeling very upset when something reminded you of the birth experience?’, ‘Having strong physical reactions when something reminded you of the birth experience (i.e., heart pounding, trouble breathing, sweating)?’ Response scale ranged from 0 (Not at all) to 4 (Extremely). Scale reliability: pregnancy (11 items) $\alpha = .83$; after birth (20 items) $\alpha = .86$.

Procedure

Two recruitment procedures were used to maximise sample size. Firstly, volunteer antenatal practitioners who run the antenatal courses informed their groups about the study, and noted down the contact details of women who were interested. Secondly, women who had signed up for the antenatal course were emailed directly by the organisation with information about the study and asked if they were willing to participate. Contact details of all women who were interested in the study were passed onto the lead researcher, and women were contacted with full study information sheets and an online link to the study, hosted by Qualtrics.

Once women clicked on the study link they were taken to a holding page which once again presented the study information, along with the study inclusion criteria and various safe-guarding messages. Participants were then asked if they consented to take part in the study, and if they did consent, were taken through to the demographic questionnaire and then onto the main study measures. At the end of the study women were asked if they were happy to be contacted again approximately ten weeks after they

had given birth, to complete the postnatal measures. As an incentive to take part at time 2, participants were told they would be entered into a £50 prize draw should they complete the time 2 survey. Those who agreed to take part were emailed again between 8 and 12 weeks after birth. On average, at time 1 the questionnaire took 20 minutes to complete, and at time 2 it took 15 minutes to complete.

The prize draw was conducted by the lead researcher three months after the study closed. The names of all participants who completed the time 2 measures were printed out, put into a box, and one name was withdrawn. The participant was contacted and offered a £50 voucher to a shop of her choice. The research project satisfied British Psychological Society (BPS) ethical guidelines and was approved by the University Research Ethics Committee.

Results

Overview

In the first section – Trauma – we present a series of longitudinal multiple regressions and two cross-sectional mediation analyses. In relation to the paper's first aim, the regressions examine whether adult attachment relates to posttraumatic symptoms/cognitions. Relevant to the second aim, the cross-sectional analyses of the postnatal data examine whether the relationship between group identification (family/friends and/or antenatal group) and posttraumatic symptoms/cognitions is mediated by social support.

In the second section – Well-being – we present various longitudinal mediation analyses and longitudinal regressions. In relation to the third aim, we examine whether the relationship between adult attachment and well-being is mediated by strength of group identification with family/friends *and* self-efficacy (serial vs parallel mediation).

Also relevant to the third aim, we present multiple regression analyses of adult attachment onto general distress.

In relation to the fourth aim, we present a multiple regression analysis examining the relationships between prenatal group identification (family/friends and antenatal group) and postnatal well-being. Also in relation to the fourth aim, we present a longitudinal mediation analysis examining whether identification with the antenatal group relates to well-being via perceived support during labour. All results pertain to the paper's final aim of examining whether family and friends or antenatal group identification may be more protective in a perinatal context.

In all analyses, unless otherwise stated, previous PTSD diagnosis and previous psychiatric diagnosis were controlled for as they are known risk factors for PTSD. Age was also controlled for, unless otherwise stated, as it related to posttraumatic cognitions longitudinally.

Participant attrition and missing value analysis

Participants who dropped out of the study during the demographic questionnaire (i.e. before the study variable questionnaire had commenced) were removed from the study ($n = 32$). Of the remaining participants ($N = 712$), from late pregnancy (time 1) to 10 weeks after birth (time 2), we experienced a 56% attrition. Using chi-squared tests and MANOVA (then t-tests) we ascertained whether those who completed the full study (Completers, $n = 314$) differed significantly from those who only completed the time 1 measures (Non-completers, $n = 398$). No significant mean differences were observed in any of the continuous variables. Chi square tests on all categorical demographic variables revealed only one significant difference between completers and non-completers. Non-completers and completers consisted of a similar number of

women who were educated to university level (non-comp. vs. comp; 333 vs. 280), secondary level (5 vs. 6), and who classified themselves using the ‘other’ category (13 vs. 13). However, the drop-outs were more likely to be A-level or college educated than those who completed the study (47 vs. 12)^{xiii}, $\chi^2(3) = 15.70, p = .001$.

There were two types of missing data. The first type comprised participants who randomly missed one or two items from one of the measures. For these participants, their mean score for the measure was calculated from the valid data points they provided. The second type of missing data was more severe and reflects participants who had missed 40% or more of the items from a single measure. These cases were excluded from any analyses using the measure. In the most severe case, 122 participants missed more than 40% of psychological well-being items, meaning that the $N = 583$ for the analyses involving well-being. Despite these relatively high levels of missing data, missing value analysis (MVA) revealed that no pattern of missing data existed beyond gradual attrition. Missing value analysis (MVA) was performed on all variable total and mean scores. All variables were used as grouping variables (completers vs. non-completers) and there were no significant differences in the mean prenatal or postnatal well-being, PTSS, posttraumatic cognition or general distress scores.

Sample characteristics

The majority of participants (55%) had a vaginal birth in hospital, another 16% a vaginal birth at a midwife-led unit and 2% a vaginal birth at home, 20% of women had an emergency caesarean and 7% an elective caesarean. Levels of strength of identification to the antenatal groups were relatively high, and family and friends group identification was higher still. Social support was notably high, as was self-efficacy (t2). Well-being was high at both t1 and t2, and posttraumatic cognitions and trauma

symptoms were low at both time points. There were no significant differences between t1 and t2 means scores for any variable. All variable means, *SDs*, ranges and *Ns* are reported in Table 1.

Table 1 Intercorrelations among main variables; means are based on whole data set; correlations are based on those who completed t1 and t2 with N varying from 291-641; variable B. Supp. = perceived support during birth (t2); * $p < .05$; ** $p < .01$

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
1. Fear. At. t1	-	.61**	-.59**	-.48**	-.27**	-.31**	-.20**	-.07	.41**	.35**	.35**	.20**	.33**	.30**	-.18**	-.31**	-.24**	-.30**	-.16**	-.22**
2. Fear. At. t2		-	-.52**	-.54**	-.19**	-.24**	-.07	-.02	.24**	.35**	.16**	.20**	.16**	.28**	-.02	-.28**	-.16*	-.28**	-.13*	-.21**
3. Sec. At. T1			-	.54**	.32**	.26**	.22**	-.01	-.37**	-.32**	-.34**	-.15*	-.37**	-.21**	.21**	.27**	.29**	.18**	.18**	.19**
4. Sec. At. T2				-	.30**	.26**	.14*	.07	-.26**	-.26**	-.12**	-.15**	-.19**	-.23**	.22**	.29**	.22**	.27**	.14*	.18**
5. F&F Id. T1					-	.61**	.20**	.13*	-.24**	-.15*	-.20**	-.14*	-.24**	-.16**	.21**	.25**	.28**	.21**	.10	.00
6. F&F Id. T2						-	.23**	.10	-.25**	-.22**	-.15*	-.21**	-.11	-.25**	.12	.31**	.26**	.33**	.17**	.13*
7. Ante. Id. T1							-	.62**	-.20**	-.11	-.17**	-.14*	-.12**	-.13*	.22**	.20**	.20**	.23**	.15*	.11
8. Ante. Id. T2								-	-.02	-.06	-.07	-.17**	.03	-.10	.08	.11	.19**	.20**	.12*	.03
9. PTCI t1									-	.47**	.59**	.24**	.50**	.37**	-.23**	-.25**	-.28**	-.21**	-.11	-.35**
10. PTCI t2										-	.42**	.56**	.37**	.60**	-.18**	-.37**	-.21**	-.30**	-.14*	-.38**
11. PTSS t1											-	.42**	.73**	.49**	-.21**	-.23**	-.30**	-.21**	-.08	-.37**
12. PTSS t2												-	.37**	.65**	-.08	-.26**	-.15*	-.22**	-.07	-.31**
13. CORE t1													-	.49**	-.28**	-.21**	-.35**	-.19**	-.06	-.33**
14. CORE t2														-	-.07	-.35**	-.18**	-.45**	-.08	-.48**
15. Well-b t1															-	.19**	.21**	.07	.01	.15*
16. Well-b t2																-	.20**	.26**	.15**	.37**
17. Supp. T1																	-	.53**	.17**	.10
18. Supp. T2																		-	.18**	.25**

Table 1 continued

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
19. B. Supp.																			-	0.6
20. Self eff t2																				-
Mean	2.72	2.71	5.16	5.18	6.34	6.46	5.27	5.53	1.87	1.77	.54	.41	.69	.57	5.79	5.79	5.55	5.45	4.44	3.41
N	559	291	561	292	585	303	599	305	628	312	629	312	634	308	641	311	583	303	314	306
Std dev	1.66	1.75	1.54	1.60	0.83	0.75	1.07	1.30	0.76	0.82	0.46	0.40	.02	.03	1.16	1.24	0.35	0.43	1.07	.48

Bivariate correlations

Pearson's correlation coefficients are reported in Table 1. As expected, and consistent with previous research, both fearful and secure attachment were correlated not only with all outcome variables, but also all study variables apart from antenatal group identification after birth (t2). Identification with family and friends during pregnancy and after birth (t1, t2), and antenatal group identification during pregnancy (t1), were correlated with all study variables. However, antenatal group identification after birth (t2) was not correlated with many study variables. Of note though, it was correlated with trauma symptoms after birth (t2), social support during pregnancy and after birth (t1, t2), perceived support in labour (t2) and family and friends group identification during pregnancy (t1).

Trauma

Attachment style in pregnancy and postpartum posttraumatic

symptoms/cognitions. To assess whether adult attachment style related to either posttraumatic cognitions or trauma symptoms over time we ran four multiple regressions. In the first analyses, as well as the usual controls (age, previous PTSD and previous psychiatric diagnosis - see Overview), we additionally controlled for posttraumatic cognitions during pregnancy (t1), and regressed fearful attachment measured at the end of pregnancy (t1) onto postnatal (t2) posttraumatic cognitions. Prenatal fearful attachment was positively associated with postnatal posttraumatic cognitions (Table 2). The regression was repeated using trauma symptoms as the outcome variable, but fearful attachment was not a significant longitudinal predictor. To better understand possible causation, a reverse regression was conducted: posttraumatic cognitions (t1) was regressed onto fearful attachment (t2), whilst additionally

controlling for fearful attachment (t1). Posttraumatic cognitions were not a significant longitudinal predictor of attachment.

Whilst controlling for the usual variables, secure attachment during pregnancy (t1) also predicted postnatal posttraumatic cognitions (see Table 2) but did not predict postnatal trauma symptoms. The ‘preoccupied’ and ‘dismissing’ attachment categories were not related to posttraumatic cognitions or symptoms longitudinally.

Table 2

Summary of two final longitudinal multiple regression models for fearful and secure attachment predicting posttraumatic cognitions over time, controlling for age, previous PTSD diagnosis and/or psychiatric diagnosis and time 1 cognitions

	Posttraumatic cognitions			Posttraumatic cognitions		
	<i>N</i> = 250			<i>N</i> = 253		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Age	.22*	.09	.14	.24**	.09	.15
Previous PTSD	.04*	.67	.003	.02	.67	.002
Previous psychiatric	-.24	.15	-.09	-.16	.16	-.06
Post. cog t1	.41***	.07	.36	.44***	.07	.38
Fearful attachment t1	.10***	.03	.20	-	-	-
Secure attachment t1	-	-	-	-.10**	.03	-.19
<i>R</i> ²		.26			.26	
<i>F</i>		11.27			10.76	

Note: * $p < .05$, ** $p < .01$; *** $p < .001$

Group identification and posttraumatic symptoms after birth. To

investigate whether group identification (family/friends and/or antenatal group) may impact posttraumatic symptoms and cognitions, via support, in the aftermath of a challenging life event (birth), a series of mediation analyses were conducted. There were no significant longitudinal effects of group identification (family/friends and/or antenatal group) on posttraumatic symptoms/cognitions. However, the relationships were reliable in the cross-sectional postnatal (t2) data. In step 1, family and friends group identification was associated with social support. Step 2 revealed a significant total effect of family and friends identification on posttraumatic symptoms ($\beta = -.10$). The relationship was weakened in step 3 by the addition of social support to the regression model, revealing a significant direct effect ($\beta = -.07$). The indirect effect of identification with family and friends on posttraumatic stress symptoms via the social support mediator was also significant ($b = -.03$, LCI $-.0602$, UCI $-.0067$). (Figure 1 and Table 3). The mediation was repeated to examine whether the relationship between group identification with family and friends after birth (t2) relates to posttraumatic cognitions (t2) via social support (t2), but no mediation was detected.

The mediation was repeated using antenatal group identification as the independent variable. Results from Hayes PROCESS (2012) provides evidence consistent with the hypothesis that the relationship between strength of identification with the antenatal group (t2) and trauma symptoms (t2) was mediated by social support at t2 (Figure 1 and Table 4). In step 1, antenatal group identification was related to social support. Step 2 revealed a significant total effect of antenatal group identification on posttraumatic stress symptoms ($\beta = -.05$). The relationship was weakened by the introduction of social support to the model, revealing a significant direct effect ($\beta = -.04$). The indirect effect of identification with the NCT group on posttraumatic stress

symptoms via the social support mediator was also significant ($b = -.01$, LCI $-.0222$, UCI $-.0028$). The mediation was repeated to examine whether the relationship between group identification with the antenatal group after birth (t2) relates to posttraumatic cognitions (t2) via social support (t2), but no mediation was detected.

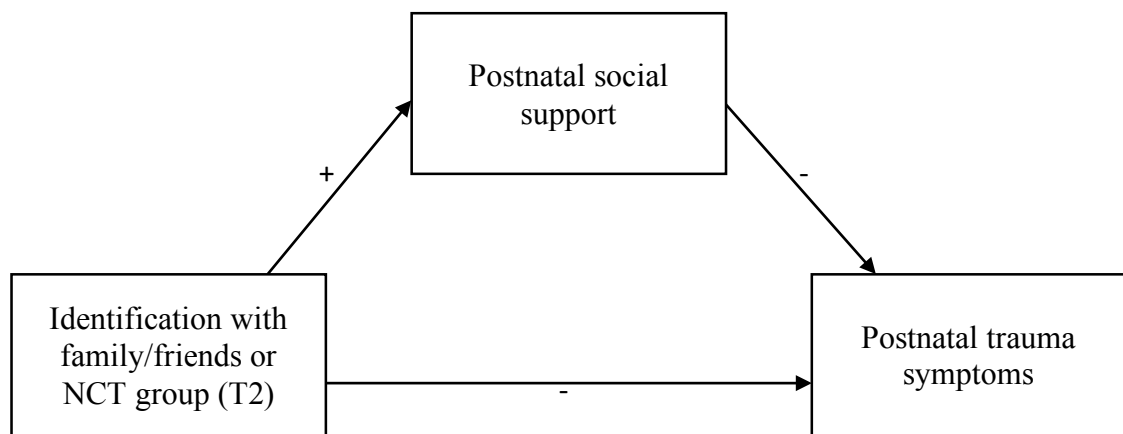


Figure 1. Conceptual cross-sectional mediation model, identification with family/friends or the NCT group on posttraumatic stress symptoms via postnatal social support. See Tables 3 and 4 for full regression models

Table 3

Cross-sectional postnatal mediation models of family and friends identification on posttraumatic symptoms (t2), via social support, $N = 299$

	Step 1	Step 2	Step 3
	DV = Soc. supp.	DV = PTSS	DV = PTSS
Age	-.04	.03	.02
Previous PTSD	-.24	.21	.18
Previous psychiatric	-.04	-.15	-.16
F&F identification	.20***	-.10**	-.07*
Social support	-	-	-.15**
R^2	.12	.06	.08
F	9.69	4.48	5.13
df	4	4	5

Note: * $p < .05$, ** $p < .01$; *** $p < .001$

Table 4

Cross-sectional postnatal mediation models of antenatal group identification on posttraumatic symptoms (t2), via social support, $N = 299$

	Model 1	Model 2	Model 3
	DV = Soc. supp.	DV = PTSS	DV = PTSS
Age	-.04	.03	.02
Previous PTSD	.01	.08	.28
Previous psychiatric	.10	-.23**	.08*
Antenatal identif.	.07***	-.05**	-.04*
Social support	-	-	-.17**
R^2	.04	.05	.08
F	3.37	3.92	5.21

Note: * $p < .05$, ** $p < .01$; *** $p < .001$

Well-being

Attachment style during pregnancy and postpartum psychological well-being. To better understand the relationships between adult attachment and psychological well-being a series of theoretically driven mediations were conducted. In the introduction, it was hypothesised that the relationship would be mediated by strength of group identification with family and friends and/or self-efficacy. Social cure theory (Haslam et al., 2018) supports a serial mediation from group identification to self-efficacy to well-being. However, this was not supported in the longitudinal or cross-sectional data. Results did support a *parallel* mediation (attachment to well-being via group identification *and* self-efficacy). In step 1, the relationship between fearful attachment (t1) was associated with family and friends group identification (t2) and in step 2 fearful attachment was associated with self-efficacy (t2). In step 3 fearful attachment was associated with well-being ($\beta = -.17$), and the relationship was weakened in step 4 by the addition of family and friends group identification and self-efficacy ($\beta = -.10$). Hayes (2012) PROCESS analysis revealed evidence consistent with partial mediation (Figure 2 and Table 5). The total indirect effect of fearful attachment on well-being via both mediators was significant, $b = -.06$, LCI $-.1190$, UCI $-.0202$. The indirect effect of fearful attachment to well-being via only self-efficacy was also significant ($-.04$, LCI $-.0740$, UCI $-.0060$), however, the indirect effect via only family and friends identification was not significant.

To help ascertain the robustness of the longitudinal relationship between attachment and psychological well-being, a further regression analysis was conducted using the clinical measure CORE-10, a widely used measure of general distress. Fearful attachment was associated longitudinally with general distress, whilst additionally controlling for general distress (t1; see Table 6). The relationship was not mediated by

either group identification or self-efficacy. To help assess the issue of causality, well-being (t1) and general distress (t1) were separately regressed onto fearful attachment (t2), whilst additionally controlling for fearful attachment at t1. Wellbeing and general distress were not significant longitudinal predictors of fearful attachment.

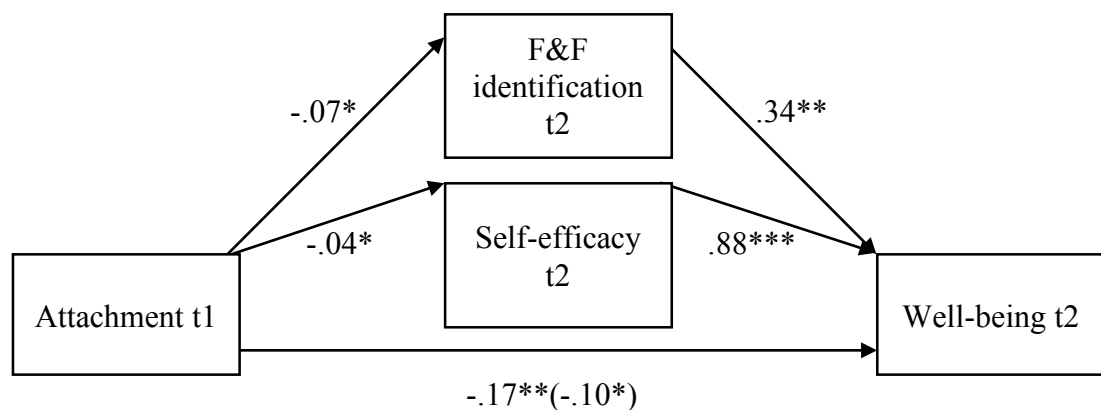


Figure 2. Longitudinal serial mediation model of women’s prenatal fearful adult attachment on postnatal well-being via postnatal family and friends identification and postnatal self-efficacy. The direct effect of fearful attachment on well-being whilst controlling for both mediators is included in parenthesis. There was a significant total indirect effect of fearful attachment on well-being via the mediators, $ab = -.06$, LCI $-.1190$, UCI $-.0202$. See Tables 5 for full regression model

Table 5

Longitudinal parallel mediation models of fearful attachment (t1) on well-being (t2), via family and friends identification (t2) and self-efficacy (t2), $N = 244$

	Step 1	Step 2	Step 3	Step 4
	DV = F&F	DV = S-Eff.	DV = Well-b.	DV = Well-b.
Control variables				
Age	.04	-.04	-.17	-.16
Previous PTSD	2.14***	.04	-.66	-1.56
Previous psychiatric	.43**	.21*	.37	.01
Well-being t1	-.03	-.01	.07	.09
F&F identification t1	.52***	-.09*	.29**	.16
Self-efficacy t1	.05	.56***	.43*	-.08
Model variables				
Fearful attachment t1	-.07*	-.04*	-.17**	-.10*
F&F identification t2	-	.08	-	.34**
Self-efficacy t2	-	-	-	.88***
R^2	.43	.31	.17	.27
F	25.48	13.29	6.68	9.64
df	7	7	7	9

Note: * $p < .05$, ** $p < .01$; *** $p < .001$; all dependent variables (DVs) are postnatal (time 2)

Table 6

Summary of two final longitudinal multiple regression models for fearful attachment predicting general distress and well-being, controlling for age, previous PTSD diagnosis and/or psychiatric diagnosis and t1 outcome variables

	General distress			Well-being		
	<i>N</i> = 247			<i>N</i> = 250		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Age	.07	.06	.08	-.18	.16	-.07
Previous PTSD	.14	.42	.02	-.45	1.22	-.02
Previous psychiatric	-.19	.10	-.11	.44	.28	.10
General distress t1	.49***	.07	.39	-	-	-
Well-being t1	-	-	-	.15*	.07	.14
Fearful attachment t1	.05**	-	-	-.22***	.05	-.27
<i>R</i> ²		.25			.13	
<i>F</i>		7.09			19.80	

Note: * $p < .05$, ** $p < .01$; *** $p < .001$

Group identification in pregnancy and postpartum well-being. To examine the fourth aim, a series of regression analyses were conducted. To assess whether group identification (family/friends and/or antenatal) related to either well-being and/or general distress over time we ran four multiple regressions. In the first analyses, as well as the usual controls, we additionally controlled for well-being during pregnancy (t1), and regressed identification with family/friends and identification with the antenatal group, both measured at the end of pregnancy (t1), onto postnatal (t2) well-being. Prenatal identification with family/friends and prenatal identification with the antenatal group were both positively associated with postnatal well-being (Table 7). The regression was repeated using general distress as the outcome variable, but identification was not a significant longitudinal predictor. To better understand possible causation, a reverse regression was conducted: well-being (t1) was regressed onto identification with family/friends (t2), whilst additionally controlling for identification with family/friends (t1). Well-being was not a significant longitudinal predictor of identification with family/friends. The regression was repeated using identification with the antenatal group as the dependent variable, and revealed that prenatal well-being did not predict postnatal identification with the antenatal group.

To examine whether the relationship between group identification during pregnancy and postnatal psychological well-being was mediated by postnatal social support, a series of mediations were conducted. The relationships between identification with family/friends and the antenatal group were not mediated by social support. An exploratory mediation was conducted using perceived support during labour as a mediator, and the mediation was significant. In step 1, strength of identification with antenatal group (t1) was associated with perceived support during labour. In step 2, strength of identification with antenatal group (t1) was associated with t2 well-being (β

= .17), and the relationship was weakened in step 4 by the addition of perceived support ($\beta = .15$). Hayes (2012) PROCESS analysis revealed evidence consistent with mediation (Figure 3). To help assess the issue of causality, well-being (t1) was regressed onto strength of identification with antenatal group (t2), whilst additionally controlling for antenatal group identification (t1). Well-being was not a significant longitudinal predictor of antenatal group identification. The mediation analyses were repeated to examine whether the relationship between prenatal identification with family/friends and postnatal well-being was mediated by perceived support during labour, but no mediation effect was observed.

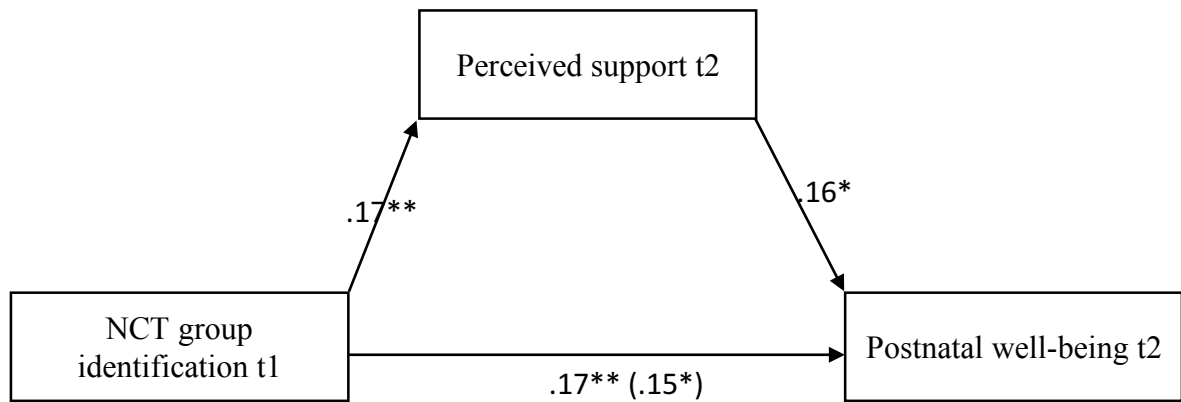


Figure 3. Standardised regression coefficients for the longitudinal relationship between strength of identification with NCT group during pregnancy (t1) and postnatal well-being (t2) as mediated by perceived support during labour (t2). The standardised regression coefficient between NCT identification and well-being, controlling for perceived support, is in parenthesis. $N = 267$; * $p < .05$, ** $p < .01$, *** $p < .001$

Table 7

Summary of final longitudinal multiple regression model for strength of identification with family/friends and the antenatal group predicting well-being over time, controlling for age, previous PTSD diagnosis and/or psychiatric diagnosis and time 1 well-being

Well-being			
<i>N</i> = 264			
	<i>B</i>	<i>SE B</i>	β
Age	-.10	.15	-.04
Previous PTSD	-.53	.58	-.06
Previous psychiatric	.42	.29	.09
Well-being t1	.13*	.07	.12
Fam./friends Ident. t1	.28**	.09	.18
Antenatal Ident. t1	.15*	.07	.13
<i>R</i> ²		.11	
<i>F</i>		5.34***	
<i>df</i>		6	

* $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

The overarching aim of this study was to better understand support in the perinatal period by examining factors that may be antecedent to, comprise or be consequences of, social support, and, in turn, their effect on maternal mental health in the postpartum. This aim, and the more specific objectives, have in general been achieved. Firstly, the paper aimed to establish if adult attachment style related to posttraumatic stress symptoms or cognitions. In relation to this, fearful and secure attachment were both associated with posttraumatic cognitions over time. Secondly, the paper aimed to examine whether group identification was related to posttraumatic stress and/or cognitions, and if so, whether it was operating via social support. The relationship between strength of group identification (with family and friends *and* the antenatal group) after birth and postnatal posttraumatic stress symptoms was found to be mediated by social support. The paper's third aim was to examine whether adult attachment related to psychological well-being or general distress. Fearful attachment during pregnancy related to postnatal general distress and postnatal well-being. We hypothesised a mediation from adult attachment to well-being via group identification and/or self-efficacy. The longitudinal relationship between fearful attachment and well-being was found to be mediated in parallel by group identification with family and friends and general self-efficacy. A serial mediation (identification onto self-efficacy) was not observed. The paper's fourth aim was to examine whether group identification was related to well-being or general distress, and if so, whether it was operating via social support. In the same regression, strength of group identification with family/friends and identification with the antenatal group during pregnancy were found to relate to postnatal well-being. Although no social support mediation was observed, the relationship between antenatal group identification during pregnancy and postnatal

well-being was mediated by perceived support during labour. All longitudinal findings are made more notable because the reverse associations (cognitions to attachment; general distress to attachment; well-being to attachment; well-being to antenatal group identification; well-being to family/friends identification) were not observed, and therefore allow us to comment on causality. All results pertain to the paper's final aim of examining whether identification with groups of family and friends, or identification with antenatal groups, most greatly benefitted women in terms of their postnatal well-being and mental health. Based on the current findings, both groups appear to play a protective role. They appear to be operating similarly in the postnatal context, in that identification with family and friends, and identification with the antenatal group, were found to relate to posttraumatic stress symptoms via social support. However, longitudinally, we found that adult attachment relates to well-being via identification with family and friends; and antenatal group identification was itself related longitudinally to well-being via perceived support during labour. The longitudinal results do not suggest that either group provides more or less benefit than another, but the results do highlight that the groups appear to operate differently.

In the context of perinatal mental health research, these findings support the continued use of adult attachment theory and social identity theory to understand women's support networks and needs. Although the impact of women's attachment styles on postnatal well-being and mental health has been considered in the literature, the inclusion of group identification in analyses of support during the perinatal period is noteworthy, as it is largely absent from the field. Consistent with previous research (Woodhouse, Brown, & Ayers, 2018), this study found a link between attachment and identification, in that dispositional adult attachment appears to be antecedent to group identification, and may affect well-being via this mechanism. Social identity theory

does not normally entertain the notion that antecedent dispositional factors can affect the process of group identification, but our results suggest otherwise.

The finding that adult attachment during pregnancy does not relate to posttraumatic symptoms after birth is not consistent with previous research in longitudinal perinatal samples (Ayers et al., 2014). Although the current study did not replicate the longitudinal relationship, bivariate correlations did reveal an association between adult attachment and postnatal PTSS. The low levels of PTSS within the sample and the stability of symptoms longitudinally are likely to have made observing an effect over time extremely difficult.

Posttraumatic cognitions are now considered symptoms of PTSD (Am. Psych. Assoc., 2013), although their inclusion is still hotly debated. Because of this controversy, the current study chose to include a full, separate, measure of posttraumatic cognitions. Using this full measure of cognitions, a longitudinal association with attachment was found. Although this result cannot speak to the relationship between attachment and all symptom clusters (as measured by the PCL-5), the finding certainly implicates attachment in the development of one of PTSD's symptom clusters. Given the socially referent nature of posttraumatic cognitions, we would expect an adult's relationship style to affect these types of negative cognition. Findings support the separate measurement of posttraumatic cognitions, particularly when exploring the effect of social factors on posttraumatic stress.

As advocated in the social cure literature (Jetten, Haslam, & Haslam, 2012), our findings support the idea that strong group identification is associated with better health and well-being. We observed that identification with both types of groups during pregnancy appears to be associated with well-being after birth. Identification with family and friends appears to be a mechanism through which attachment affects well-

being; and identification with the antenatal group appears to affect women's perception of support during labour. The overarching message from these longitudinal findings are that antenatal groups and groups of family and friends both play supporting roles for women during the perinatal period, but both appear to relate to different aspects of women's social worlds. The observed relationship between attachment and family and friends identification suggests that our interactions with groups of close family and friends may be particularly sensitive to dispositional attachment schemas (over and above attachment's influence on other groups – i.e. antenatal groups not comprised of close family and friends). Likewise, that antenatal group identification was found to affect well-being via perceived support during labour (whereas identification with family and friends did not), suggests that groups can uniquely influence relevant aspects of our perceptions of support and health/wellbeing. The antenatal group discussed birth and support during birth, so the observed affect not only supports social cure theory, it is also rather remarkable. Postnatally, findings suggest that a strong identification with both types of group may relate to lower postpartum PTSS via social support. The postnatal and longitudinal (antenatal identification to support during labour to well-being) findings are noteworthy as they confirm previous findings that group identification may be affecting health and well-being through its effect on support (Haslam, O'Brien, Jetten, Vormedal, & Penna, 2005). People who more strongly identify with a group may either receive or perceive higher levels of support, and this in turn appears to lead to higher well-being and lower PTSS.

Within this sample we did not find support for the idea that self-efficacy may also act as a mediating factor between identification and well-being. Instead, and as supported by previous research (e.g., Corcoran & Mallinckrodt, 2011; Meredith et al., 2006; Wei et al., 2005), it may be a mechanism through which adult attachment affects

well-being. Combined with the finding that attachment appears to affect well-being through strength of identification with family/friends, the result may be particularly useful within the perinatal mental health field. However, results do not support the social cure's proposition that self-efficacy is a mechanism by which identification has its effects on health and well-being. Despite this, using social identity theory, and focusing on processes of group identification, enabled us to offer what we believe is a valuable contribution to our collective understanding of perinatal support needs.

Strengths and limitations

This study is one of the first to examine the processes of group identification to better understand social support in the perinatal period. The application of social identity theory to examine whether groups of family and friends or antenatal groups are of greater benefit to women's postnatal well-being and mental health is both novel and valuable. As well as being theoretically interesting, the finding that strong identification with a specific group can have a positive impact on postnatal well-being and mental health can also be practically applied to help women in the perinatal period. Our examination of the relationship between attachment, group identification and well-being is also notable as it presents a challenge to theories of group identification by highlighting the role of antecedent factors. The study has a longitudinal design which allows slightly stronger causal inferences, especially since reversing the direction of independent and dependent variables yielded no reliable results. The sample itself, derived from the UK's leading provider of antenatal support groups, is previously unstudied in this context and is also a strength.

A few limitations are also acknowledged. The attrition rate was high and, although this is not unusual for this type of prospective study, future studies should aim to reduce the drop-out rate. One of the study measures – support during labour – had low reliability ($\alpha = .30$). Although the low reliability could reflect the small number of items, it is noted here as a limitation and future studies should aim to use a more reliable measure. A further limitation is the low level of traumatic symptoms present within the postnatal sample. We aimed to study the effect of group identification on posttraumatic stress symptoms, and no effect was observed longitudinally. However, it is highly likely that the result reflects the low level of posttraumatic symptoms. Future studies should aim to examine the relationship in a sample with high levels of PTSS. This limitation does not detract unduly from our findings as they apply to the perinatal mental health field, but do detract from our contribution to the field of posttraumatic stress research.

Future research and clinical implications

The findings support the wider application of group identification processes to better understand how our relationships to those around us may positively impact health and well-being. We found that strength of identification with groups of close family and friends *and* with antenatal groups appear to positively affect postnatal mental health and well-being. Within this sample, the two groups appear to operate in different ways, but both affect well-being longitudinally and posttraumatic stress symptoms postnatally. Private and government providers of antenatal education services should be aware that strengthening women's identification with the group is likely to increase postnatal well-being and mental health. Further, strengthening women's identification with their family and friends is also likely to increase postnatal well-being and mental health.

Perinatal interventions aimed at increasing identification with family and friends, and antenatal groups, should be designed and tested. Given that groups of family and friends are a cost-free resource available to many women, focusing on this group is logical. This is especially true given that this resource appears to be largely overlooked by current perinatal service providers. Focused research into socially isolated women is also necessary to ascertain whether the role of antenatal groups may be more important in the absence of groups of family and friends.

The finding that attachment appears antecedent to identification is worthy of further research to establish under which circumstances the relationship exists. This study also supports further research into perceived support in labour, and how this is operating.

Conclusion

This paper successfully illustrates the benefits of considering support during the perinatal period in terms of adult attachment and strength of group identification. By considering processes of group identification, the paper was able to compare the benefits of antenatal support and family/friends support. It appears that although both groups are protective they operate in different ways, with antenatal identification partially operating through perceived support in labour and family/friends identification operating as a mechanism of adult attachment. The paper's finding that attachment may be, at least in part, affecting well-being through its effect on identification with family/friends is a novel and useful contribution to the literature. Future research and clinical interventions aimed at determining how we can access and increase women's strength of identification with groups of family and friends – given that these groups are freely available to many women – may be the most beneficial overall. The finding that

increased identification with the antenatal group may actually affect women's perceptions of support during labour is also a compelling reason to continue researching group identification in a perinatal context.

Chapter 6

General discussion

This thesis presented four studies which were carried out with the aim of investigating the role of various social factors in the development of PTSS. This final chapter will draw together and summarise the findings from all four papers. It will discuss how the results, and the conclusions drawn in each paper, meet the overall aims of the paper stated in the introduction (see *Summary and research questions*, above). The clinical and theoretical implications of the research will be discussed, and directions for future research suggested.

Summary of findings

The key findings from the papers presented in this thesis are reported below under two headings that relate to the thesis aims and objectives. Firstly, the role of adult attachment in a posttraumatic context; and secondly, the role of social factors (e.g., group identification) in a posttraumatic context.

The role of adult attachment in a posttraumatic context

The first aim of the thesis was to investigate the relationship between adult attachment and the development of symptoms of PTSD. The thesis aimed to systematically examine evidence of the relationship, of which there was a considerable amount, albeit sometimes conflicting. Results from the meta-analysis (chapter 2) indicate that there is a medium sized association between secure attachment and lower PTSD symptoms, and a similar association in the opposite direction between insecure attachment and higher symptoms of PTSD. Not only was the relationship between adult

attachment and PTSS confirmed, results revealed that attachment categories comprised of high levels of attachment anxiety most strongly related to symptoms. The fearful attachment category – comprised of high levels of anxious and avoidant attachment behaviours – displayed the largest association. Although avoidant attachment, as measured on a continuum, was found to relate to elevated PTSS, dismissing attachment (low anxiety and high avoidance) was not found to relate to higher PTSS. Results are confirmed in subsequent studies that found fearful attachment most strongly related to symptoms of PTSD, and that dismissing attachment did not relate to PTSS (chapters 3 and 5). Studies also confirmed the apparently protective role of secure attachment (chapters 3 and 5).

The exploratory social model (chapter 3) provides support for the theoretical proposition that attachment is antecedent to posttraumatic symptoms and PTSD (Sharp et al., 2012). The model – in which attachment is also antecedent to other social factors – successfully explained a considerable amount of variance in both posttraumatic cognitions and core trauma symptoms. Given the cross-sectional nature of the data, causation can only be weakly inferred, but the longitudinal study (chapter 5) also provides some evidence of the antecedent role of attachment. Fearful and secure attachment were found to predict posttraumatic cognitions – themselves symptoms of PTSD – from pregnancy to birth. When the regression was reversed, neither attachment category was predicted by posttraumatic cognitions. Attachment in pregnancy also predicted both postnatal general distress and postnatal well-being, but distress and well-being measured during pregnancy did not predict postnatal attachment (chapter 5). Of note, in this sample, attachment was stable, with no significant mean differences in women's fearful or secure attachment before and after birth. Collectively, these results

support the idea that attachment is antecedent to mental health and well-being in a posttraumatic context.

Results from the cross-sectional online study suggest that, in part, adult attachment may be operating on posttraumatic cognitions and symptoms via its effect on group identification (chapter 3). The longitudinal study did not find that attachment affects posttraumatic symptoms, so the possible mediating effect of group identification could not be assessed (chapter 5). Results are not surprising given the low levels of PTSS in the sample, and the stability of the trauma symptoms that were present. Results from the longitudinal study indicate that fearful adult attachment may be operating on postnatal well-being via two parallel mechanisms: group identification and general self-efficacy. Given that previous research has found that over 30% of women describe labour as a traumatic experience (Creedy, Shochet, & Horsfall, 2000) and that between 20-30% of women will experience a traumatic birth as defined by the DSM Criterion A (Diagnostic and Statistical Manual IV & 5, Am. Psych. Assoc., 2000, 2013; Ayers, Harris, Sawyer, Parfitt, & Ford, 2009; Ayers, Wright, & Thornton, 2018), the findings are relevant within a posttraumatic context.

The role of social factors in a posttraumatic context

The second overarching aim of this thesis' was to examine the role of social factors (e.g., group identification) in a posttraumatic context. Because of its novel contribution to the literature, the exploratory cross-sectional result that group identification appears to play a role in the development of symptoms of PTSD (chapter 3) is further examined through the veteran identification study (chapter 4) and the longitudinal perinatal study (chapter 5). Across all studies, strength of group identification is found to relate to fearful attachment, secure attachment, social

acknowledgement, social support, well-being, general distress, posttraumatic cognitions and core trauma symptoms (chapters 3, 4 and 5).

Results suggest that the process of group identification may be operating within a posttraumatic context in two primary ways (chapters 3, 4 and 5). Firstly, and as reported above, the effect of fearful attachment onto people's mental health and well-being was mediated by group identification (chapters 3 and 5). Secondly, within a postnatal and a veteran sample, the relationship between group identification and posttraumatic cognitions and/or symptoms was found to be mediated by social support (chapters 4 and 5). Results support the 'social cure' proposition that group identification affects health and well-being via the mechanism of social support. Relevant to this, is the longitudinal finding that strong identification with an antenatal group before birth appears to increase postnatal well-being, via the mechanism of perceived support during labour (chapter 5). Identification with family and friends during pregnancy was also related to postnatal well-being, but was not mediated by social support or perceived support during labour within this sample.

A secondary aim of the thesis was to propose and examine an exploratory social model of posttraumatic stress to help explain symptom variance. An exploratory social model was examined (chapter 3), and mediation models were also presented (chapters 4 and 5). All chapters included in the thesis provide results pertaining to this aim, many of which are outlined above. To summarise, results from the meta-analysis (chapter 2) specifically highlight the effect of adult attachment style on symptom variance, with results from chapters 3 and 5 supporting, and building on, this finding. The exploratory social model (interpersonal trauma – emotional disclosure – acknowledgment; attachment – identification – acknowledgement; acknowledgement – cognitions – core trauma symptoms) explained a moderate amount of variance in core trauma symptoms,

and a large amount of variance in posttraumatic cognitions (chapter 3). The cross-sectional (chapter 3) finding that group identification may affect symptom variance is further explored and corroborated through subsequent mediation analyses (chapters 4 and 5).

The cross-sectional study (chapter 3) compared the utility of two different exploratory social models of PTSS. The first model used the social acknowledgement construct, and the second replaced acknowledgement with a traditional social support construct. Both models explained a similar amount of variance in core trauma symptoms, but the social acknowledgment model explained considerably more variance in posttraumatic cognitions. This finding supports the theoretical proposition that the field consider constituents and process of social support, rather than relying on the social support construct (Charuvastra & Cloitre, 2008). In both the social acknowledgement and the social support model, a large amount of variance in posttraumatic cognitions was explained, and significant pathways led from cognitions to core trauma symptoms. This finding supports the inclusion of posttraumatic cognitions within social models of PTSS, separate to measures of core trauma symptoms (chapters 3, 4 and 5).

Implications of findings

Implications for our understanding of adult attachment

Considerable empirical evidence supports the idea that adult attachment relates to posttraumatic stress symptoms in various populations, including veterans (Nye et al., 2008), the bereaved (Boelen, 2012), prisoners of war (Ein-Dor, Doron, Solomon, Mikulincer, & Shaver, 2010), civilians experiencing missile fire (Besser & Neria, 2012), survivors of the September 11th World Trade Centre (WTC) attack (Fraley et al., 2006), women after childbirth (Iles, Slade, & Spiby, 2011), and many more. Theoretical explanations of this relationship are also mounting (e.g., Fraley, 2002) and social models of the development of symptoms of PTSD include adult attachment (e.g., Sharp et al., 2012). Through systematic evaluation of the empirical evidence, this research found that adult attachment was related to posttraumatic stress, as predicted by research and theory. The consistent medium effect size across all adult attachment categories and styles, and across all populations and traumas, implies that adult attachment has a predictable and pertinent role to play in the posttraumatic environment.

Empirical evidence of which attachment category and style most strongly relates to PTSS is somewhat contradictory, with some theorists suggesting that attachment avoidance may actually lower symptoms (e.g., Fraley et al., 2006; Frey, Blackburn, Werner-Wilson, Parker, & Wood, 2011). The thesis' meta-analytic finding that attachment categories comprised of high levels of anxiety, in particular fearful attachment, most strongly related to PTSS, provides a clear answer to elements of this debate. The finding that avoidant attachment systematically related to higher PTSS provides some clarity, but the contrary finding that the dismissing attachment category did not significantly relate is somewhat confusing. The findings support theorists who highlight the potential issues with avoidant attachment, and lead us to speculate that the

complexity of the avoidant-PTSS interaction may be sensitive to confounds, individual differences, samples, traumatic events etcetera. Of note, the dismissing attachment category is comprised of high avoidance and low anxiety. Taken collectively, the meta-analytic findings increase our understanding of how and when attachment is operating in a posttraumatic context. This enables the field to focus on explaining why fearful attachment appears to most affect symptoms, and under which circumstances and why dismissing and/or avoidant attachment does not relate to PTSS.

There is considerable theoretical and empirical debate around attachment stability (see *Attachment stability*), and the meta-analytic study could not address this issue. Likewise, it did not address the issue of causation. Studies subsequent to the meta-analysis followed a core theoretical proposition of both infant and adult attachment theories: that the attachment system which originated in infancy continues to influence behaviour, thought and feeling into adulthood (Fraley, 2002). It is this overarching theoretical proposition that guided the placement of attachment as antecedent to all other social factors in the exploratory model and the longitudinal mediation models. Results of longitudinal regressions and mediations support the proposition, and carry more weight because of the study's unique ability to measure adult attachment before the challenging life event took place. Both studies provide support to Sharp et al.'s (2012) attachment model of PTSD, and imply that a future social model should cast attachment an antecedent role.

The cross-sectional online research has found, as predicted by the 'social cure' approach, that adult attachment may be operating on social acknowledgement, posttraumatic cognitions and symptoms via its affect on group identification. Also in support of the 'social cure', are the longitudinal parallel mediation results. The mediation indicates that fearful attachment to postnatal well-being may be mediated by

group identification and self-efficacy. Given that over 30% of women describe labour as a traumatic experience (Creedy et al., 2000), the findings are relevant within a posttraumatic context and support the application of the ‘social cure’ approach within our assessment of posttraumatic responses more broadly.

Within the perinatal study, self-efficacy was examined as a possible mediator of group identification onto mental health and well-being, *and* of attachment onto mental health and well-being. The ‘social cure’ proposition that self-efficacy may be a mechanism of group identification (Haslam et al., 2018) was not supported in this sample. However, it appears that, within a perinatal context, a woman’s fearful dispositional attachment style may lower their postnatal well-being through its negative affect on their ability to consider themselves capable and effective. The result supports previous research in this area linking attachment and different types of self-efficacy (Meredith, Strong, & Feeney, 2006; Wei, Russell, & Zakilik, 2005). The empirical and theoretical evidence that self-efficacy after the trauma may be protective (e.g., Benight et al, 2015; Flatten, Walte, & Perlitz, 2008), also supports the continued investigation of self-efficacy as a mediator of attachment in the posttraumatic environment.

The longitudinal attachment to well-being via group identification finding, and cross-sectional attachment to posttraumatic cognitions/symptoms via group identification result, have implications for our understanding of how attachment operates in a posttraumatic context. This is primarily discussed in the context of the ‘social cure’ literature below, but addressed here first in the context of attachment research. In a study of university students, Kobak and Sceery (1988) found that the securely attached group perceived higher levels of social support, and was rated less hostile by their peers. The dismissing group perceived lower social support and more negative relationships, and was rated as more hostile by their peers. The preoccupied

group was viewed as more anxious by their peers but viewed their family as more supportive than the dismissing group. Also relevant are the numerous studies that find adult attachment relates to posttraumatic stress via social support (e.g., Besser & Neria, 2012; Mikulincer, Florian & Weller, 1993). Theoretically, we would expect securely attached adults to perceive adequate support and comfortably rely on others to meet their needs, whereas we would expect insecurely attached individuals to perceive less support and be less able to access support. Although neither the social support studies, or Kobak and Sceery's (1988) study, adequately explain the mechanisms at work, they do implicate adult attachment in social interaction and perceptions of support. Sharp et al.'s (2012) attachment model also proposes that adult attachment affects social cognition and social support, and in turn affects PTSS, and explains this affect through the idea of mentalising. Sharp et al. (2012) explain that: "Mentalizing refers to the natural human capacity to interpret the behavior of others within a mentalistic framework— that is, an individual's ability to ascribe desires, feelings, thoughts, and beliefs to others and to employ this ability to interpret, anticipate, and influence others' behavior" (p. 231). They go on to suggest that "the extant literature on attachment and mentalizing suggests that mentalizing capacity is either delayed or impaired in the case of insecure attachment."

Previous research and theory within the field of adult attachment and/or traumatic stress is outlined above to illustrate the fields' focus on the mediating role of social cognition/support, and the theoretical proposition that individual attachment can affect social interaction. This finding in this thesis that attachment may be partly operating through group identification within a posttraumatic environment supports this previous research and theory. However, the findings also highlight the benefits of moving away from the social support construct towards more nuanced social processes.

By considering processes of group identification, we also find a theoretical base – the social identity approach – to help explain some of the effects we have witnessed.

Below, we attempt to explain the attachment – group identification – mental health and well-being results using both adult attachment theory and social identity/self-categorisation theory.

Implications for our understanding of social factors

The thesis has supplied various findings that implicate strength of group identification in mental health and well-being in a posttraumatic context, and therefore supports the ‘social cure’ approach. Strength of veteran group identification was found to relate to lower posttraumatic cognitions. Postnatal identification to family and friends, and identification with an antenatal group, was related to lower core trauma symptoms, and prenatal identification with those groups was related to higher postnatal well-being. Further, group identification helped explain variance in posttraumatic cognitions and symptoms in the exploratory social model.

Taken collectively, the longitudinal findings imply that within a perinatal context, strong identification with family and friends *and* strong identification with an antenatal group may be beneficial to women. The finding that strong identification with family and friends may be beneficial to health and well-being is supported by previous research (Swartzman, Sani, & Munro, 2016), but the antenatal group result appears to be novel. Of interest is the finding that the groups appear to be operating differently. Identification with family and friends appears to mediate the relationship between attachment and well-being, but identification with an antenatal group does not appear to be affected by an individual’s attachment style. Antenatal group identification does appear to relate to postnatal well-being via perceived support during labour. Taken

together, results imply that identification with groups of close family and friends may be particularly affected by dispositional attachment schemas. Other groups, not comprised of close family and friends, may be less sensitive to an individual's attachment style. Likewise, that antenatal group identification was found to relate to perceived support during labour, but identification with family and friends was not, implies that groups can uniquely influence relevant aspects of support perception and health/well-being. During the antenatal education classes, participants discussed birth and birth support, so its apparent effect on well-being via the mechanism of perceived support during labour provides robust support for the 'social cure' approach.

The finding that the two groups appear to operate differently, has implications for how social identity and 'social cure' researchers conceive of groups. In most cases, social identity research does not pay much attention to the *kinds* of groups people identify with. The thesis findings support previous research that considers how different groups may serve different functions (Aharpour & Brown, 2002) or satisfy different motives (Easterbrook & Vignoles, 2012).

As the summary findings outline, results imply that group identification may be operating in two ways to affect mental health and well-being in a posttraumatic environment. Firstly, within two unusual and 'hard-to-reach' groups, group identification is found to be operating on posttraumatic cognitions and symptoms through social support. Taken together, these results suggest that strength of identification with a group is operating on mental health and well-being in a posttraumatic context via either perception or actual receipt of higher levels of support. Results provide clear evidence of the 'social cure' proposition that effective social support is a key resource through which identification affects health and well-being. The paper found no support for the 'social cure' proposition that group identification

affects health and well-being through its effect on self-efficacy. Secondly, the effect of fearful attachment onto postnatal well-being appears to be partially operating through its effect on group identification. The exploratory model also implicates group identification as a mediator of adult attachment. These findings also support the ‘social cure’ approach, and have implications for our understanding of the process of group identification.

The observed effect adult attachment appears to have on group identification, and the theoretical explanation of the findings in this thesis, are presented as one of our major contributions to the literature. The introduction justifies the investigation of the effect that antecedent factors – specifically adult attachment – may have on processes of group identification. Theoretical justification for the effect of adult attachment on the process of group identification is speculative, but based on previous research and theory. Attachment theory proposes that securely attached children will use their caregiver as a secure base from which to confidently explore their surroundings, but an insecurely attached child will not (Bowlby, 1982). Considerable empirical evidence supports this theoretical proposition (Ainsworth, 1978). It follows that securely attached adults are also more likely to use romantic partners as a secure base from which to explore the world, and empirical evidence supports this (e.g., Fraley & Davis, 1997). This idea – that secure adults may confidently explore their social worlds, and insecure ones may not – is presented here as one of our theoretical justifications for proposing that attachment may affect group identification. Also relevant, and linked to this, is the idea of internal working models of relationships. These models are internalised representations, schemas, of the worthiness of the *self* and expectations of others’ reactions to the self. The idea that the self is internally viewed as worthy or unworthy has implications not just for our personal sense of self, but also our sense of self based

on the groups we are part of – our social identity. Mikulincer and Shaver (2013) present numerous empirical studies and a sound theoretical argument for the effect attachment has on personal identity formation. They draw attention to identity theorists Erikson (1968) and Marcia (1980). Marcia (1980) proposes that identity formation involves both exploration and commitment. Exploration of all aspects of life, and a commitment to integrating cogent aspects into the personal identity, provides meaning to one's life. This identity formation and sense of meaning is a fundamental source of subjective well-being, sense of self-worth and personal adjustment (Erikson, 1968). Within the social identity literature there is ample evidence that social identities also relate to well-being (Haslam et al., 2018), and to self-worth (e.g., Martin, Balderson, Hawkins, Wilson, & Bruner, 2018), and that self-esteem is a fundamental identification motivation (e.g., Easterbrook & Vignoles, 2012). Here we speculate that adult attachment will affect not just personal identity formation, but also social identity formation through the combined mechanisms of its effect on social exploration and sense of self-worth as it relates to others.

Securely attached individuals, for example, find it easy to become emotionally close to others, are comfortable depending on others and having others depend on them, and view their *self* as inherently worthy in the context of others (Hazan & Shaver, 1987). This thesis speculates that not only might securely attached individuals who more confidently explore the world have more opportunity to take part in groups, they are more likely to strongly relate to the groups they are part of because of their healthy relationship schema and self-representation. We speculate that the process of social group identification is a normative one and, as such, we would expect to observe this adaptive social process in securely attached adults. This normative process will be

maladaptive in insecure adults who explore less and view their self as unworthy in the context of others.

The exploratory social model explained a considerable amount of variance in symptoms of PTSS. Essentially, the model combined aspects of two previously proposed social models, and included a novel, exploratory, social factor – group identification. Our findings support Sharp et al.’s (2012) attachment model which highlights the antecedent role of attachment and its effect on posttraumatic symptoms via social cognition. It also supports aspects of Maercker and Horn’s (2013) socio-cognitive model (i.e., their proposed link between interpersonal trauma, emotional disclosure and social acknowledgement). Overall, subsequent studies in the thesis provide considerable support for the exploratory model’s attachment – group identification – social acknowledgement – posttraumatic cognitions – core trauma symptoms pathway. The pathway from interpersonal trauma – emotional disclosure – social acknowledgment – posttraumatic cognitions – core trauma symptoms, is not examined within the thesis beyond the exploratory model. This was appropriate given the previous literature supporting the utility of the interpersonal trauma event distinction (e.g., Charuvastra & Cloitre, 2008; Frans et al., 2005; Kessler et al., 1994, 2005) and the effect of emotional disclosure within a posttraumatic context (e.g., Pennebaker, Zech, & Rimé, 2001). Less is understood about the utility of social acknowledgment. The thesis finding that, within this model, social acknowledgment explained considerably more variance in posttraumatic cognitions than the social support construct has implications for the future study of acknowledgement and its inclusion in a future model.

The thesis aimed to re-examine the social support construct. The exploratory model focused on three processes that may be involved in social support: the

interpersonal emotional disclosure process, the group identification process and the social acknowledgment construct. These constructs were chosen because, firstly, they are supported within previous literature and theory, and, secondly, because they operate on different social levels. Maercker and Horn (2013) highlight the relational, dynamic, nature of social processes and demonstrate the utility of creating models that span different levels of social interaction. The success of the exploratory model indicates that analysing constituents of social support in terms of whether they are interpersonal, group or societal may be a useful guiding principle.

The finding that the relationship between group identification and posttraumatic cognitions/symptoms may be mediated via social support, may also be relevant for our understanding of social support. It also supports the exploratory model's proposition that social support may be comprised of group identification. As predicted by the 'social cure' approach (Haslam et al., 2018), perceptions and/or receipt of social support appear to be affected by an individual's strength of identification with pertinent groups in their life. That group processes affect social support is relevant not just for our understanding of identification, but also for our broader understanding of support.

The research supports the theoretical proposition that posttraumatic cognitions help explain variance in core trauma symptoms (Ehlers & Clark, 2000). Posttraumatic cognitions are therefore worthy of measuring separately to, and in more detail than, many current measures of PTSD allow. We propose that this finding is another major contribution of the thesis, this time not to the social identity literature, but to the field of posttraumatic stress research. Negative cognitions were subsumed into the PTSD diagnostic criteria in the latest edition of the Diagnostic and Statistical Manual (DSM V, Am. Psych. Assoc., 2013). Self-report measures now include a small number of posttraumatic cognition items (e.g., PCL-5, Weathers et al., 2013). Taken collectively,

the findings of this thesis indicate that subsuming posttraumatic cognitions into the diagnosis of PTSD may hamper our understanding of the causal mechanisms of symptoms development and perseverance (Ehlers & Clark, 2000). This may be particularly true as the field attempts to build a social model of symptoms, as these specific cognitive appraisals of the self, others and the world, are inherently social. This thesis supports theoretical proposals that posttraumatic cognitions are likely mechanisms through which social and relational factors affect core trauma symptoms (Ehlers & Clark, 2000).

Limitations

Various limitations are observed within the individual studies that comprise the thesis. These limitations affect the ability of this thesis to meet its overarching aims, and are outlined below.

The longitudinal prospective study of women from pregnancy to birth makes a valuable contribution to attachment theory and the ‘social cure’ approach by examining the relationship between attachment and group identification (family and friends vs antenatal). This study was used to hone in on this relationship in a unique group-situation but, on reflection, this was done to the detriment of the ability of this thesis to understand core trauma symptoms. By working with our partner organisation – the UK’s largest provider of group antenatal courses – we expected to recruit a large sample, and this was achieved. We anticipated that between 3 and 5% of the sample would develop PTSD. Based on previous research, we expected between 30 and 40% of women to consider the event ‘extremely challenging’ and/or traumatic. As such, we expected a relatively high level of sub-diagnostic traumatic symptoms. In reality, PTSS levels in the sample were extremely, and unusually, low; and well-being was high. This

may relate to the socio-economic nature of the sample, as the vast majority were wealthy, employed, Caucasian women living with partners/husbands. The low-risk nature of the sample hampered our ability to find PTSS variance to match that of the general population. On reflection, a control sample of women from varying socio-economic backgrounds, with free or no antenatal group support, was necessary to allow us to find adequate PTSS levels. Unfortunately, although the initial study design did include a control group, recruitment was so slow and arduous, numbers were too low to provide a match sample.

Also relevant to the longitudinal study is the second limitation. On reflection, the overall thesis would have benefitted from the inclusion of the social acknowledgement construct in the longitudinal perinatal measures. As we were working with a partner organisation, their own aims and objectives also affected the choice of study variables. We had to prioritise variables, and measure some that did not feed directly into the thesis aims and objectives. Social acknowledgement takes a central role in the exploratory model, and the full acknowledgment measure operates on various social levels, including groups. As such, on reflection, our understanding of posttraumatic symptoms *and* group identification may have benefited from inclusion of the social acknowledgement construct in the longitudinal study.

Although the meta-analytic study adequately systematically assessed the relationship between adult attachment and PTSD, and successfully analysed the utility of different attachment styles and categories in explaining variance in PTSS, on reflection the moderation analysis is inadequate. Study variables are adequately analysed, but possible mechanisms of attachment onto PTSD cannot be ascertained due to insufficient studies reporting effect sizes. Although this is not the fault of the meta-analytic study, it affects the ability of this thesis to comment on how and why

attachment – and in particular fearful attachment – may affect PTSD. It is therefore highlighted here as a limitation.

The online study testing the exploratory model was limited by its cross-sectional design. Because the model was exploratory, at the time the study was designed an online cross-sectional sample was considered adequate. Since subsequent papers focused on the role of group identification in the posttraumatic context, the exploratory model was not tested in its entirety in a longitudinal sample within the thesis. In hindsight, the online sample would have benefited from longitudinal analysis, and is a clear limitation to the model's explanatory power.

Another limitation of the cross-sectional study relates to our aim of re-examining the social support construct. Although we tested an alternative model that replaced social acknowledgement with social support, a further model should have been tested replacing the constituents of social support – emotional disclosure, group identification and social acknowledgement – with social support itself. This would have allowed the thesis to comment on whether social support is comprised of these processes.

The cross-sectional veteran study also would have benefitted from a longitudinal design, but this was not possible due to the 'hard-to-reach' nature of the sample. Although the study makes a unique contribution to the literature by analysing the role of group identification within a veteran sample, the sample size is small. The size of the sample is a direct result of the unusual nature of the sample, many of whom were veterans with extremely high levels of PTSS. The small sample size, although unavoidable in this treatment-seeking veteran sample, is considered a major limitation of the study.

Theoretical directions

The above implications lead to further questions, and the limitations reveal gaps in the thesis research programme, all of which reveal future directions for research and theory. Firstly, this thesis was designed in direct response to calls for comprehensive social models of posttraumatic stress (Charuvastra & Cloitre, 2008). The findings of this thesis suggest that both adult attachment and group identification should be included in a future social model. Separately, they appear worthy of inclusion in social models, but the demonstrable relationship between the two is also worthy of inclusion. Additionally, this thesis supports previous models positioning posttraumatic cognitions as a mechanism in the development and perseverance of PTSD, and should therefore be measured separately in future models. The support this thesis provides for the inclusion of these three variables – adult attachment, group identification and posttraumatic cognitions – is considered its main contribution to a future social model.

Additionally, results suggest that pathways leading from attachment – group identification – social support – posttraumatic cognitions – core trauma symptoms should be explored. Results from the cross-sectional study also support future investigation of the replacement of social support with social acknowledgement. Likewise, pathways from interpersonal trauma – emotional disclosure – social acknowledgement are worthy of future investigation. Critically, these pathways and relationships need testing within mixed trauma samples with longitudinal study designs.

The perinatal longitudinal study offers a useful contribution to attachment literature, ‘social cure’ research and perinatal research. Many of the findings also offer useful contributions to the field of posttraumatic stress research, but as discussed in the above limitations, the low symptom levels within the sample mean no firm conclusion can be drawn. As such, an important and necessary next step is to adapt the perinatal

study for a mixed trauma sample, using a longitudinal design. Relationships between attachment, group identification, self-efficacy and posttraumatic cognitions and symptoms should be explored.

The perinatal study found that fearful attachment appears to relate to well-being via self-efficacy. Previous research found that adult attachment relates well-being via to social support (e.g., Lane & Fink, 2015) and attachment has been hypothesised to relate to well-being via meaning/purpose (see Mikulincer & Shaver, 2013). All three of these attachment mechanisms – social support, self-efficacy, and meaning/purpose – have been proposed as possible mechanisms through which group identification may affect well-being and health. As such, and given the apparent effect of attachment onto well-being via group identification, we suggest that future research and theory considers the relationships between the mechanisms of group identification and adult attachment. This is especially important given that this thesis finds no evidence that self-efficacy is a mechanism of group identification. More broadly, and within future ‘social cure’ research, the mechanisms of group identification and shared social identities need to be explored. If no evidence of the proposed mechanisms can be found, the theory needs to adapt.

A novel finding in the longitudinal study is the effect of perceived support during labour on postnatal well-being. Although its effect is seen on postnatal well-being rather than PTSS, the unusual event categorisation is worthy of further consideration. Future studies within perinatal samples should re-test the event categorisation. The unusual event categorisation is also worthy of testing within other trauma samples where support during the event can be quantified. For example, during collective social traumas like natural disasters, or during treatment for life-threatening illnesses.

Relevant to this thesis, and suggested here as worthy of future research, is the study of traumas that occur *because* of individual's group identity. A hate crime, for example an attack on a gay person or Muslim person, is perpetrated because of the individual's group identity. Research in this area finds that victims of hate crimes have significantly more symptoms of depression, posttraumatic stress, anxiety and anger compared to other crime victims (Herek, Gillis, & Cogan, 1999). This kind of intergroup trauma may be different to other interpersonal traumas, and are suggested here as worthy of examination in future social models of PTSS. This is particularly important in light of the findings in this thesis that group identification appears to relate to mental health and well-being in a posttraumatic context.

Some attention needs to be given to the finding that antenatal group identification was not affected by attachment within the perinatal sample. It may be the case that processes of identification with certain types of groups are more greatly affected by attachment than others. The thesis results imply that groups comprised of close interpersonal relationships may be more affected by attachment schemas. The finding does not contradict our theoretical explanation of how attachment may affect group identification processes (secure-base, social exploration and a sense of self-worth in relation to others). It does, though, highlight the need for further research, within a wide variety of samples, to ascertain the types of groups most greatly affected by attachment. Once again, and in contrast with social identity theory, we find support for the idea that there are different kinds of groups and that they may function differently.

Clinical practice and policy directions

The findings of this thesis can be applied in numerous ways, and it is in this application that we find the major strength of the thesis. The corroboration in this thesis of the role of adult attachment in the development of PTSS, and the finding that our shared social identities also appear to affect symptom progression separately, and taken together, have implications for practice and policy.

The meta-analysis draws together decades of research in the field, and gives us robust effect sizes to base current policy and practice on. Unless future research contradicts our findings, we can state with some certainty that screening for insecure attachment, and in particular attachment categories comprised of high levels of anxiety, would be beneficial. Screening will enable clinicians to ‘red flag’ individuals at higher risk of developing PTSD. This screening could be done prior to high-risk situations or after traumatic events. For example, screening military personnel prior to combat duty or pregnant women as part of routine antenatal checks prior to birth. Individuals found to be high in attachment anxiety should be alerted of their higher risk to empower choice and support seeking. Further, ensuring that support staff, in the case of military personnel, and health visitors, in the case of pregnant women, are alerted to the risk would enable better monitoring and support if needed. There is also a likely benefit from screening after a traumatic event – for example at hospital accident and emergency departments, or after a natural disaster. Whether screening took place before or after an event, both scenarios enable clinicians to better ascertain risk and therefore more accurately monitor the ‘correct’ individuals, thereby allowing quicker intervention should symptoms arise.

The longitudinal study findings lead to various practice and policy directions, many of which were suggested to our partner organisation. The most important of these,

and the one we believe will have the largest effect on the largest number of women, is the finding that within a perinatal sample, strong identification with a group of close family and friends *and* strong identification with an antenatal group appear to be beneficial to women. This has implications for private antenatal providers and government national health services (NHS). Given that groups of family and friends are a cost-free resource available to many women, focusing on ways to increase women's strength of identification with this group is a logical first step. This is especially true given that this resource appears to be largely overlooked by current perinatal service providers. Interventions, similar to the Groups 4 Health identification interventions proposed and tested by Haslam et al. (G4H; 2018), aimed at specifically increasing identification with groups of family and friends and antenatal groups, should also be designed and tested. In doing so, the benefit of these different types of groups could again be compared.

Given its cross-sectional design and small sample, clinical and policy recommendations based on paper 3 (chapter 4) are made here speculatively. Results suggest that investment in designing and evaluating clinical interventions aimed at increasing veteran identification (e.g., ex-service personnel's broad veteran identity) may be beneficial. Increasing identification with a specific group may bring more calculable benefits, and military investment in veteran organisations and community hubs may be valuable. Designing and evaluating interventions aimed at increasing identification with veteran organisations that already exist - for example, the British Legion or The Not Forgotten Association – may be a cost effective way to proceed, and simultaneously evaluate our findings.

Concluding remarks

This thesis had two overarching aims: to investigate the relationship between adult attachment and the development of symptoms of PTSD, and to examine the role of social factors (e.g., group identification) in a posttraumatic context. Results address both aims, and the secondary aims, and hopefully provide a useful contribution to the fields of attachment, ‘social cure’ and posttraumatic stress research.

There are two main theoretical and empirical contributions of the thesis. First is the finding that group identification appears to mediate the effect of adult attachment onto mental health and well-being in a posttraumatic environment. These results, paired with the theoretical explanation in the thesis of how attachment may affect group identification processes, offer a unique contribution to all three fields of research. Secondly is the collective evidence that various social factors appear to well explain variance in posttraumatic cognitions, and that these in turn appear to explain core trauma symptoms. The point here is not the social factors themselves, but the utility of separating posttraumatic cognitions from core trauma symptoms. These findings speak to the heart of the debate about how we diagnose PTSD, and its burgeoning diagnostic criteria (Pai et al., 2017). This thesis supports the previously held clinical and theoretical proposition, that posttraumatic cognitions are best positioned as *mechanisms* of symptom development rather than symptoms themselves. The separation of posttraumatic cognitions – which are ostensibly a form of social appraisal – and core symptoms, may be particularly important as the field attempts to build workable social models of posttraumatic stress.

It is hoped that the thesis reaches further than its theoretical and empirical contributions to the literature. It is the *application* of the research programme’s

findings, and the potentially positive effect these applications could have on individual lives, that we hope is the major contribution of this thesis.

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Appendices

Chapter 3 study measures

Group identification

We would like to know about the social groups you are part of. By ‘groups’ we mean collections of people that are important to you and with whom you interact regularly. You do not necessarily have to meet them face-to-face, the communication may be online or over the phone. This may be a group you feel generally positive towards, or it may be a group you find challenging. Example of groups are: family, a friendship circle, social gathering (i.e., people you go to the pub with), a work team or people at your work place, a sports team, a household, class mates, a support group, and many more. Please choose the social group that you most identify with and write the name of that group below.

Group _____

Please respond to the following statements on the basis of how you feel about THIS GROUP and your membership in it.

I have a lot in common with other members of this group.

I feel strong ties to other members of this group.

I find it difficult to form a bond with other group members.

I am glad to belong to this group.

I often regret that I am a group member.

It is pleasant to be in this group.

I often think about the fact I am in this group.

The fact that I am a member of this group rarely enters my mind.

In general, being a member of this group is an important part of my self-image.

(0-7 scale; strongly disagree – strongly agree)

Social acknowledgement

Please read each of the statements below and tells us how much you agree or disagree with each.

Somehow I am no longer a normal member of society since the incident

Most people cannot imagine how difficult it is simply to continue with "normal" daily life

The reactions of my acquaintances were helpful

Many people offered their help in the first few days after the incident

My family showed a lot of understanding for my state after the incident

My family finds my reaction to the incident to be exaggerated

(0-5 scale; totally disagree – totally agree)

Adult attachment

Following are four general relationship styles that people often report. Please rate each of the relationship styles, to indicate how well or poorly each description corresponds to your general relationship style. PLEASE READ ALL STYLES BEFORE YOU ANSWER

A. It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.

B. I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.

C. I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.

D. I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.

(1-7 scale, strongly disagree – strongly agree, 4 = neutral/mixed)

Please now tell us which style you feel best represents you overall

A B C D

Emotional disclosure

How many times have you told the full story (including your surroundings, feelings, thoughts, and the involvement of yourself/others) of what happened during the event?

Since it happened I have talked about this event...

When you talk about this event, how much detail do you include?

How difficult is it for you to talk about this event?

(Qs 1&2, 0-5 scale, never – very often; Q3, 0-5, no detail – a lot of detail; Q4 0-5, not at all difficult – extremely difficult)

Social support

We are interested in the help that you received from family, friends and others following the traumatic event, and the help you receive now. Please answer the questions that follow by marking the appropriate number from the scale.

Whenever you wanted to talk, how often was there someone willing to listen just after the event?

Whenever you want to talk, how often is there someone willing to listen at the present time?

Did you have personal contact with other survivors or people with a similar experience just after the event?

Do you have personal contact with other survivors or people with a similar experience at the present time?

Were you able to talk about your thoughts and feelings just after the event?

Are you able to talk about your thoughts and feelings at the present time?

Were people sympathetic and supportive just after the event?

Are people sympathetic and supportive at the present time?

Were people helpful in a practical sort of way just after the event?

Are people helpful in a practical sort of way at the present time?

Did people you expected to be supportive make you feel worse at any time just after the event?

Do people you expect to be supportive make you feel worse at any time at the present time?

(0-7 scale; never – always)

Posttraumatic cognitions

Below are a number of statements which may or may not be representative of your thinking. Please indicate how much you agree or disagree with each statement

The event happened because of the way I acted

People can't be trusted

You can never know who will harm you

I have to be especially careful because you
can never know what happens next

The event happened to me because of the sort of person
that I am

I have permanently changed for the worse

I feel like an object, not like a person

I have no future

My life has been destroyed by the trauma

My reactions since the event so that I
am lousy at coping

There is something about me that made the event happen

(0-7 scale, totally disagree – totally agree)

Posttraumatic Stress Symptoms (intrusions, avoidance and hyperarousal)

Below is a list of comments made by people after stressful life events. Please check each item, indicating how frequently these comments were true for you during the past 7 days. If they did not occur during that time, please mark 'not at all'.

I thought about it when I didn't mean to

I avoided letting myself get upset when I thought about it or was reminded of it

I tried to remove it from my memory

I had trouble falling asleep or staying asleep, because of pictures or thoughts about it that came into my mind

I had strong waves of feelings about it

I had dreams about it

I stayed away from reminders of it

I felt as if it hadn't happened or wasn't real

I tried not to talk about it

Pictures about it popped into my mind

Other things kept making me think about it

I was aware that I still had a lot of feelings about it, but I didn't deal with them

I tried not to think about it

Any reminder brought back feelings about it

My feelings about it were kind of numb

(0-5 scale, not at all – often)

Traumatic events and interpersonal trauma

Please indicate whether any of the following traumatic events have happened to you or you have witnessed them (yes or no):

Serious accident, fire, or explosion (for example an industrial, farm, car, plane or boating accident)

Natural disaster (for example, tornado, hurricane, flood, or major earthquake)

Non-sexual assault by someone you know (for example being mugged, physically attacked, shot, stabbed or held at gunpoint)

Non-sexual assault by a stranger (for example being mugged, physically attacked, shot, stabbed or held at gunpoint)

Sexual assault by someone you know (for example, rape or attempted rape)

Sexual assault by a stranger

Military combat or experience of a war zone

Sexual contact when you were younger than 16 with someone who was 5 or more years older than you (for example, contact with genitals, breasts)

Imprisonment (for example prison inmate, prisoner of war, hostage)

Torture

Life-threatening illness

Traumatic childbirth

Other traumatic event (please specify)

If you marked more than one event above, please choose the ONE event that bothers you the most. If you marked only one traumatic event, state the same one below. If you have experienced multiple traumatic events and it's difficult to choose the event that 'bothers you the most', we still need you to choose one to focus on for the remainder of the study.

Please note: for the remainder of the study, when we mention 'the traumatic event' we are referring to the event you now choose.

The ONE event which bothers me the most from the above is

Below are a few questions about the traumatic event:

How long ago did the event happen? (*please tick*)

Less than 1 month ago

1 to 3 months ago

3 to 6 months ago

6 to 12 months ago

12 to 24 months ago

2 to 5 years ago

5 to 10 years ago

More than 10 years ago

Chapter 4 study measures

Social support, adult attachment and posttraumatic cognitions measures presented above in chapter 3 measures

Veteran identification

We are particularly interest in how much you identify with being a veteran and how you felt when you left the army. Please tell me how much you agree or disagree with each statement I read out. I'll read each statement and then the possible answers. Can I begin?

I see or communicate with other veterans frequently

I feel strong ties to other veterans

I often regret that I am a veteran

In general, being a veteran is an important part of my self-image.

(0-7 scale, strongly disagree – strongly agree)

Posttraumatic stress symptoms

Before we begin the study measures, we need to measure your current symptoms. These are similar questions to the ones the therapists will ask you every session to plot how you are responding to treatment. I will read a list of 20 problems that people sometimes have in response to a very stressful experience. Please listen to each problem carefully and then tell me how much you have been bothered by the problem **in the past month**, on a scale from 0 = Not at all, to 4 = Extremely.

How much have you been bothered by repeated, disturbing, and unwanted *memories* of the stressful experience in the past month?

Repeated, disturbing *dreams* of the stressful experience?

How much have you been bothered by suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?

Feeling very upset when something reminded you of the stressful experience?

Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?

Avoiding memories, thoughts, or feelings related to the stressful experience?

Avoiding external reminders of the stressful experience (*for example, people, places, conversations, activities, objects, or situations*)?

How much have you been bothered by having trouble remembering important parts of the stressful experience?

Strong negative beliefs about yourself, other people, or the world (*for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous*)

Blaming yourself or someone else for the stressful experience or what happened after it?

How much have you been bothered by having strong negative feelings such as fear, horror, anger, guilt, or shame?

Loss of interest in activities that you used to enjoy?

Feeling distant or cut off from other people?

Trouble experiencing positive feelings (*for example, being unable to feel happiness or have loving feelings for people close to you*)?

How much have you been bothered by irritable behaviour, angry outbursts, or acting aggressively?

Taking too many risks or doing things that could cause you harm?

Being 'super alert' or watchful or on guard?

Feeling jumpy or easily startled?

How much have you been bothered by having difficulty concentrating?

Trouble falling asleep?

(0-4 scale, not at all – extremely)

Chapter 5 study measures

Adult attachment measure are presented above in chapter 3 measures

Antenatal group strength of identification

Please respond to the following statements on the basis of how you currently feel about your antenatal GROUP.

I feel solidarity with my NCT group.

I feel committed to my NCT group.

I feel a bond with other members of my NCT group.

I am glad to belong to my NCT group.

I think my NCT group has a lot to be proud of

Being a member of my NCT group gives me a good feeling

The fact that I am a member of my NCT group is an important part of my identity

I am similar to the average member of my NCT group

Members of my NCT group have a lot in common with each other

(0-7 scale, strongly disagree – strongly agree)

Family and friends strength of group identification

We would now like you to think about your family. You can answer the questions based on your immediate family, or your wider extended family.

The fact that I am a member of my family is an important part of my identity

I feel a bond with other members of my family

I am glad to belong to my family

We would now like you to think about your friendship groups, not including your NCT group. You can answer the questions based on your closest friendships, or a wider circle of friends.

The fact that I am a member of the friendship group is an important part of my identity

I feel a bond with other members of the friendship group

I am glad to belong to the group of friends

(0-7 scale, strongly disagree – strongly agree)

General self-efficacy

Thanks to my resourcefulness, I know how to handle unforeseen situations.

I can solve most problems if I invest the necessary effort.

I can remain calm when facing difficulties because I can rely on my coping abilities.

If I am in trouble, I can usually think of a solution.

I can usually handle whatever comes my way.

(0-4 scale, not at all true – exactly true)

Social support

For each of the following statements, please tick one box which shows how you feel about the support you have right now.

Is there someone whom you can count on to listen to you when you need to talk

Is there someone available to give you good advice about a problem

Is someone available to you who shows you love and affection

Is there someone to help you with daily chores

Can you count on anyone to provide you with emotional support (talking over problems or helping you make a difficult decision)

Do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide

Are you currently married or living with a partner

(1-5 scale, never – always)

Psychological well-being

To what extent do you agree with each of the following statements?

I lead a purposeful and meaningful life

My social relationships are supportive and rewarding

I am engaged and interested in my daily activities

I actively contribute to the happiness and well-being of others

Am competent and capable in the activities that are important to me

I am a good person and live a good life

I am optimistic about my future

People respect me

(0-7 scale, strongly disagree – strongly agree)

General distress

The page has 10 statements about how you have been OVER THE LAST WEEK.

Please read each statement and think how often you felt that way last week. Then tick the box which is closest to this.

I have felt tense, anxious or nervous

I have felt I have someone to turn to for support when needed

I have felt able to cope when things go wrong

Talking to people has felt too much for me

I have felt panic or terror

I made plans to end my life

I have had difficulty getting to sleep or staying asleep

I have felt despairing or hopeless

I have felt unhappy

Unwanted images or memories have been distressing me

(0-4 scale, not at all – most or all the time)

Posttraumatic cognitions

Below are a number of statements which may or may not be representative of your thinking. Please indicate how much you agree or disagree with each statement

Difficulties during the birth happened because of the way that I acted

People can't be trusted

You can never know who will harm you

I have to be especially careful because you can never know what happens next

I can't deal with even the slightest upset

Since the birth, I have permanently changed for the worse

I feel like an object, not like a person

I have no future

My life has been destroyed by my birth experience

My reactions since the birth so that I am lousy at coping

I will never be able to feel normal emotions again

There is something about me that led to the difficulties during birth

(0-7, totally disagree – totally agree)

Posttraumatic stress symptoms

Below is a list of problems that people sometimes have in response to a very stressful experience. Keeping your birth experience in mind, please read each problem carefully and then indicate how much you have been bothered by that problem in the past month, on a scale of 1 to 5.

In the past month, how much were you bothered by:

Repeated, disturbing, and unwanted memories of the birth experience?

Repeated, disturbing dreams of the birth experience?

Suddenly feeling or acting as if the birth experience were actually happening again (*as if you were actually back there reliving it*)?

Feeling very upset when something reminded you of the birth experience?

Having strong physical reactions when something reminded you of the birth experience (*for example, heart pounding, trouble breathing, sweating*)?

Avoiding memories, thoughts, or feelings related to the birth experience?

Avoiding external reminders of the birth experience (*for example, people, places, conversations, activities, objects, or situations*)?

Trouble remembering important parts of the birth experience?

Having strong negative beliefs about yourself, other people, or the world (*for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous*)?

Blaming yourself or someone else for the birth experience or what happened after it?

Having strong negative feelings such as fear, horror, anger, guilt, or shame?

Loss of interest in activities that you used to enjoy?

Feeling distant or cut off from other people?

Trouble experiencing positive feelings (*for example, being unable to feel happiness or have loving feelings for people close to you*)?

Irritable behavior, angry outbursts, or acting aggressively?

Taking too many risks or doing things that could cause you harm?

Being “superalert” or watchful or on guard?

Feeling jumpy or easily startled?

Having difficulty concentrating?

Trouble falling or staying asleep?

(1-5 scale, not at all – extremely)

ⁱ Where ‘time since event’ is not explicitly stated within the study, but event details are provided, the earliest possible date trauma could have been experienced was entered to enable analysis. For example, in the case of the Iraq war, the earliest possible date trauma could occur is the first day of the conflict – 20th March 2003.

ⁱⁱ Please note: we followed the gender/ethnicity/marriage categorisation used by the majority of papers. Percentage (i.e. 69% Caucasian; 50% female) was primarily reported. As such, these sample characteristics lent themselves to being continuous (rather than categorical) moderators.

ⁱⁱⁱ By various/mixed trauma we refer to papers that use a sample of participants who have experienced different traumatic events. For example, Benoit et al. (2010), who analyse a sample drawn from hospital admissions, with the majority of participants having experienced road accidents, but others having experienced accidents at work, burns or falls.

^{iv} Ten items from Ullman’s (2000) Social Reactions Questionnaire (SRQ) were administered but not used in the final analysis due to the similarity of questions to the social acknowledgment questionnaire and the relatively low alpha compared to other measures ($\alpha = .65$).

^v Not all DSM V traumatic events are included on the list, and the ‘other’ category allows participants to self-determine whether an event is traumatic. Diagnosis of PTSD requires a traumatic event specifically included in the DSM. The events list we have used was not included to enable diagnosis. We included it to allow us to understand the sample and provide information on the interpersonal/non-interpersonal event classification.

^{vi} The data contained no extreme outliers, as defined using the third inter-quartile range (3 x IQR) rule. However, three moderate outliers were identified via boxplots (1.5 x IQR). Sensitivity analysis was performed by removing the outliers and repeating the SEM analysis: no notable differences were observed.

^{vii} Two other measures of group identification were initially applied. First, participants were asked to choose the group they most identified with and subsequently asked a raft of questions on their strength of identification. Most participants chose family as their group. However, only 25 of the 38 participants completed the measure so it was not included in the final analysis. A short three-item measure of group membership was also initially included. Participants were asked about the number of groups they were in,

and how this may have changed since the traumatic event. However, the scale had a very low Cronbach's alpha so was not included in the final analysis.

^{viii} All regressions reported in Table 2 and Table 3 were re-run controlling for the binary variable interpersonal trauma (yes/no). All betas remained significant when controlling for interpersonal trauma.

^{ix} $p = .053$

^x $p = .053$

^{xi} According to the central limit theorem, samples greater than 30 can generally be considered to have a normal distribution with a mean equal to the population mean (Field, 2009). Normality testing indicates that our dependent variables (posttraumatic cognitions and symptoms) had normal distributions. However, because of a bi-modal distribution of veteran identification scores, and because of the relatively small sample size, we ran analyses using non-parametric tests. The pattern of Spearman rank order correlations was almost identical to the Pearson bivariate correlations reported in Table 1 (Vet Id and PTCI, $r = -.43$, $p = .01$; Vet. Id and PTSS, $r = -.38$, $p = .01$). In an attempt to repeat the mediation analyses we then ran Spearman partial correlations: veteran identification was significantly correlated with PTCI when controlling for support ($r_{XY.W} = -.35$, $p = .03$); veteran identification was not significantly correlated with PTSS when controlling for support ($r_{XY.W} = -.31$, $p = .07$). This pattern is consistent with the mediation analyses reported above.

^{xii} Due to the novelty of the study and the hard-to-reach nature of the sample, no power analysis was possible. However, the sample size is approximately commensurate with that used by Seymour-Smith et al. (N = 387; 2017).

^{xiii} Three of the participants who completed the study did not report their education level, so could not be included in these analyses.